```
% 14 + 34 + 19 + 43 + 26 = 136
% ============================
% Dossier "Animaux" (14 articles)

@TechReport{Gordon64,
        author = {Gordon, Theodore J. and Olaf Helmer-Hirschberg},
        year = {1964},
        title = {{Report on a Long-Range Forecasting Study}},
        institution = {RAND Corporation},
        url = {http://www.rand.org/pubs/papers/P2982}
% the panel of experts estimated that the possibility of "breeding of intelligent animals (ape, cetaceans, etc) for low-grade labor" could be realized as soon as 2020 with a median at 2050
}
@Article{Emery04,
        author = {Emery, Nathan J. et al.},
        title = {{The Mentality of Crows: Convergent Evolution of Intelligence in Corvids and Apes}},
        journal = {Science},
        volume = {306},
        pages = {1903-1907},
        year = {2004}
% corvid and ape appear to use the same cognitive tool kit: causal reasoning, flexibility, imagination, and prospection. nonverbal complex cognition may be a combination of these tools. convergent evolution of cognition is not built on a convergent evolution of brains. intelligence can evolve in the absence of a prefrontal cortex.
}
@Article{Trut04,
        author = {Trut et al.},
        title = {{An Experiment on Fox Domestication and Debatable Issues of Evolution of the Dog}},
        journal = {Russian Journal of Genetics},
        volume = {40},
        pages = {644–655},
        year = {2004}
% Selection for tameness involves genetic systems participating in the regulation of temporal parameters of ontogenetic development. Shifts of these parameters result in neotenic features accompanied by many phenotypic changes. This selection pressure was extreme: only 3\% of males and no more than 8 to 10\% of females were used as the parents of the next generation. Since it involved key loci of gene networks or functionally coordinated gene groups regulating development, it could destabilize ontogeny and its temporal parameters. Activity of the hypothalamus–hypophysis-adrenal system and the level of brain neurotransmitters was also affected by domestication.
}
@Article{Duncan06,
        author = {Duncan, Ian J.H.},
        title = {{The changing concept of animal sentience}},
        journal = {Applied Animal Behaviour Science},
        volume = {100},
        pages = {11–19},
        year = {2006}
% Since the middle ages, the concept of animal sentience was accepted by the secular but not by philosophers like Descartes. Only after the 18th century does it start to spread, before being impeded by behaviourism. It is nowadays motivated by animal welfare. Assessing animals indirectly is difficult and there are still gaps in our knowledge about where (on the phylogenetic scale) and when (in ontogenesis) sentience emerges.
}
@Article{Kirkden06,
        author = {Kirkden, Richard D. and Pajor, Edmond A.},
        title = {{Using preference, motivation and aversion tests to ask scientific questions about animals feelings}},
        journal = {Applied Animal Behaviour Science},
        volume = {100},
        pages = {29–47},
        year = {2006}
```

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% The assessment of animal welfare require the study of their feelings, which can be quantified indirectly with various tests measuring preference, motivation and aversion. These tests fall into two overlapping categories (choice and operant) and have each their own strengths and weaknesses, limitations and methodological problems.
}
@Article{Nicol06,
        author = {Nicol, Christine},
        title = {{How animals learn from each other}},
        journal = {Applied Animal Behaviour Science},
        volume = {100},
        pages = {58–63},
        year = {2006}
% The ability to learn from others is not ‘fixed’ but depends on the context and the social identity of both the observer and the demonstrator. On one side, the learner can gain information from a parent, a demonstrator or a dominant. On the other end, parents can adjust their display to the skill level of their offspring.
}
@Article{Pepperberg06,
        author = {Pepperberg, Irene M.},
        title = {{Cognitive and communicative abilities of Grey parrots}},
        journal = {Applied Animal Behaviour Science},
        volume = {100},
        pages = {77–86},
        year = {2006}
% Model/Rival training exclusively uses intrinsic reinforcers : reward for uttering "X" is X. data suggest that a non-human, non-primate, non-mammalian animal has a level of numerical comprehension that, in a chimpanzee, would be taken to indicate a human level of cognitive processing. Grey parrots can solve various cognitive tasks and acquire and use English speech in ways that often resemble those of very young children.
}
@Article{Broom10,
        author = {Broom, Donald M.},
        title = {{Cognitive ability and awareness in domestic animals and decisions about obligations to animals}},
        journal = {Applied Animal Behaviour Science},
        volume = {126},
        pages = {1–11},
        year = {2010}
% Concepts used in cognition, awareness and animal welfare research should be properly defined in scientific writing rather than just being referred to in descriptive but imprecise ways. Domestic animals have some ability for recognition, cognition, risk assessment, cognitive awareness, assessment awareness, emotions and feelings and hence are sentient. An ability in individuals of a species does not necessarily mean that all members of the species have the ability but the level of complexity of functioning of the animal should be taken into account. High levels of cognitive ability may often help animals to cope with their environment, but there is a possibility that animals may have fear of possible future adversity.
% In learning to navigate a maze, cows, sheep, goats and pigs performed less well than 5-year-old children but better than dogs, cats, rats, horses and several other mammals and birds when the numbers of errors were measured. When speed of learning was compared in the same study, the sequence was very similar but dogs performed as well as the farm ungulates.
}
@Article{Herzing12,
        author = {Herzing et al.},
        title = {{Responses of Human-Habituated Wild Atlantic Spotted Dolphins to Play Behaviors Using a Two-Way Human/Dolphin Interface}},
        journal = {International Journal of Comparative Psychology},
        volume = {25},
        pages = {137-165},
        year = {2012}
% A two-way communication interface (consisting of an underwater keyboard with visual and acoustic symbols indicating the objects that could be obtained and played with) was developped to study human-dolphin cooperative play behaviour. Pointing and triadic gaze between human participants was used to model the system in the presence of dolphins.
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% Dolphins are one of the few species that spontaneously understand gazing and pointing cues presented statically, but they need technologically and acoustically advanced tools both for their initiations and interactions, and humans need a real time acoustic interface to respond quickly. The dolphin’s interest in engaging in “play” with humans and in observing human responses to their behavior may provide the foundation upon which to build a two-way interface system between humans and dolphins.
}
@Article{Buchanan13,
        author = {Buchanan et al.},
        title = {{Guidelines for the treatment of animals in behavioural research and teaching}},
        journal = {Animal Behaviour},
        volume = {85},
        pages = {287-295},
        year = {2013},
%
}
@Article{Andics14,
        author = {Andics et al.},
        title = {{Voice-Sensitive Regions in the Dog and Human Brain Are Revealed by Comparative fMRI}},
        journal = {Current Biology},
        volume = {},
        pages = {},
        year = {2014},
        url = {http://dx.doi.org/10.1016/j.cub.2014.01.058}
% Dog and human vocalizations are familiar and relevant to both species. Voice areas exist in dogs and show a similar pattern to anterior temporal voice areas in humans. Sensitivity to vocal emotional valence cues engages similarly located nonprimary auditory regions in dogs and humans. The extraction of emotional information from voices is an important stage of the vocal emotion processing hierarchy and is supported by functionally analogous auditory brain regions near the primary auditory cortex in dogs and humans.
}
@Article{Graff14,
        author = {Gräff, Johannes},
        title = {{Epigenetic Priming of Memory Updating during Reconsolidation to Attenuate Remote Fear Memories}},
        journal = {Cell},
        volume = {156},
        pages = {261–276},
        year = {2014}
% Remote fear memories cannot be persistently attenuated by using reconsolidation-updating paradigms, because recalling remote memories is not salient enough to induce histone acetylation-mediated neuronal plasticity in the hippocampus. Using an HDAC2-targeting inhibitor (HDACi) during reconsolidation epigenetically primes the expression of neuroplasticity-related genes, which is accompanied by higher metabolic, synaptic, and structural plasticity. Thus, applying such inhibitors during memory reconsolidation might constitute a treatment option for remote traumata.
}
@Article{Herzing14,
        author = {Herzing, Denise L.},
        title = {{Profiling nonhuman intelligence: An exercise in developing unbiased tools for describing other types of intelligence on earth}},
        journal = {Acta Astronautica},
        volume = {94},
        pages = {676–680},
        year = {2014}
% Measures for nonhuman intelligence have included a variety of tools: (1) physical measurements – brain to body ratio, brain structure/convolution/neural density, presence of artifacts and physical tools, (2) observational and sensory measurements – sensory signals, complexity of signals, cross-modal abilities, social complexity, (3) data mining – information theory, signal/noise, pattern recognition, (4) experimentation – memory, cognition, language comprehension/use, theory of mind, (5) direct interfaces – one way and two  way interfaces with primates, dolphins, birds and (6) accidental interactions – human/animal symbiosis, cross-species enculturation. COMPLEX (COmplexity of Markers for Profiling Life in EXobiology)
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    offers a new approach to profile a variety of organisms along multiple dimensions
    including EQ – Encephalization Quotient, CS – Communication Signal complexity, IC –
    Individual Complexity, SC – Social Complexity  and II – Interspecies Interaction.
123 }
124 @Article{Smith14,
125         author = {Smith, Reginald},
126         title = {{Complexity in animal communication: estimating the size of N-Gram
    structures}},
127         journal = {Entropy},
128         volume = {16},
129         pages = {526-542},
130         year = {2014}
131 % Animal communication analyses through information theory have shown that animal
    communication can have a complex structure that goes beyond random sounds. By using
    the conditional entropy estimates at multiple orders, one can estimate the total
    repertoire sizes for animal communication for an N-gram length of one to three. While
    entropy does undercount the total repertoire size due to rare N-grams, it gives a
    more accurate picture of the most frequently used repertoire than just repertoire
    size alone. We may possibly look at the average, or most frequent, length of N-grams
    of communication in animals to gauge the depth and complexity of their communications.
132 }
133
134 % ============================
135 % Dossier "Bio-ingénierie"      (34 articles)
136
137 @Article{Stemmer95,
138         author = {Stemmer et al.},
139         title = {{Single-step assembly of a gene and entire plasmid from large
    numbers of oligodeoxyribonucleotides}},
140         journal = {Gene},
141         volume = {164},
142         pages = {49-53},
143         year = {1995}
144 % assembly PCR, derived from DNA shuffling, allows the single-step synthesis of long
    DNA sequences (1 to 3 kbp from chemically synthesized 40 bp oligos in a single
    reaction, > 10 kbp by reconstitution from 100-300 bp fragments obtained by nuclease
    digestion of the sequence of interest) is well suited for several in vitro
    mutagenesis strategies.
145 }
146 @Article{Chang99,
147         author = {Chang et al.},
148         title = {{Production of Transgenic Rats and Mice by the Testis-Mediated Gene
    Transfer}},
149         journal = {Journal of Reproduction and Development},
150         volume = {45},
151         pages = {29-36},
152         year = {1999}
153 % Testis-Mediated Gene Transfer via a liposome-complex can generate transgenic
    animals via sperm ejaculated. Transmission of the exogenous gene was confirmed up to
    the F4 generation. Transmission rates for the first generation were respectively
    3/17-2/36-3/31, but this technique can be perfected.
154 }
155 @Article{Johnson99,
156         author = {Johnsonn et al.},
157         title = {{The Beltsville Sperm Sexing Technology: High-Speed Sperm Sorting
    Gives Improved Sperm Output for In Vitro Fertilization and AI}},
158         journal = {Journal of the Animal Society},
159         volume = {77},
160         pages = {213-220},
161         year = {1999},
162         number = {Suppl. 2}
163 % Beltsville sperm sexing technology is based on the flow-cytometric separation of X-
    and Y-chromosome-bearing sperm treated with a DNA-binding fluorochrome. Skewed sex
    ratios of 85 to 95\% have been repeatably achieved, with an overall production rate
    of 5-6 million sperm/h. High-speed sorting allows breeding in the conventional
    manner, with no special training needed to conduct the insemination.}
164 }
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@Article{Willard01,
        author = {Willard, Huntington F.},
        title = {{Neocentromeres and human artificial chromosomes: an unnatural act}},
        journal = {PNAS},
        volume = {98},
        pages = {5374-5376},
        year = {2001}
% The centromere is responsible for attachment of the chromosome to the mitotic and meiotic spindle apparatus and thus for segregation of chromosomes to daughter cells during cell division. Neocentromeres appear to be indistinguishable from normal, alpha satellite-based centromeres in terms of the tromere and kichromatin and kinetochore complex that provides functional activity. But alpha satellite DNA can seed formation of de novo centromeres in artificial chromosomes (up to 50\% of clones tested) while other sequences cannot.
}
@Article{Metzgar04,
        author = {Metzgar et al.},
        title = {{Acinetobacter sp.ADP1: an ideal model organism for genetic analysis and genome engineering}},
        journal = {Nucleic Acids Research},
        volume = {32},
        pages = {5780-5790},
        year = {2004}
% cf. "Chromosomal replacement (marked deletion)" and "PCR, splicing PCR" sections
}
@Article{Ogle04,
        author = {Ogle et al.},
        title = {Spontaneous fusion of cells between species yields transdifferentiation and retroviral transfer in vivo},
        journal = {The FASEB Journal},
        year = {2004},
        doi = {10.1096/fj.03-0962fje}
% Spontaneous fusion can occur in vivo between cells of disparate species and in the absence of disease. Such hybrid cells contain chromosomal DNA from both species, can divide and express proteins from each donor, and contain endogenous retroviral DNA sequences that can be transmitted to uninfected cells. In such case, the long-term persistence of cell hybrids could induce the generation of novel pathogens.
}
@Article{Smith05,
        author = {Smith et al.},
        title = {{Sperm-mediated gene transfer: applications and implications}},
        journal = {BioEssays},
        volume = {27},
        pages = {551-562},
        year = {2005}
% - SMGT can be used in animal transgenesis, most exogenous sequences transferred are inherited as extrachromosomal structures not integrated in the host genome and show a mosaic distribution in animals. Frequency of transgenesis can be up to 80\%, but only ~25\% of viable transgenic animals produced transmit the exogenous sequences to progeny. The highest ratio of genome integration is been obtained with transgenICSI and liposome-mediated gene transfer.
% - TMGT offer a transgene-sperm transfer rate of 60-70\% with 7.5\% of offspring expressing the sequence.
% - LB-SMGT (linker based sperm-mediated gene transfer) employs sperm surface-specific monoclonal antibody (mAb C) complexed with DNA. mAb C serves as a linker molecule to attach transgenes to the surface efficiently, with integration of the sequence in the offspring's genome. Transmission rate to the F1 generation is 37.5\% for pigs and 33\% for mice, with transmission to the F2 generation obtained for pigs.
}
@Article{Blake06,
        author = {Blake et al.},
        title = {{Phenotypic Consequences of Promoter Mediated Transcriptional Noise}},
        journal = {Molecular Cell},
        volume = {24},
        pages = {853-865},
        year = {2006}
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209  % pas forcement pertinent hors bactéries
210  }
211  @Article{Hibbitt05,
212          author = {Hibbitt et al.},
213          title = {{In Vivo Gene Transfer by Electroporation Allows Expression of a
     Fluorescent Transgene in Hamster Testis and Epididymal Sperm and Has No Adverse
     Effects upon Testicular Integrity or Sperm Quality}},
214          journal = {Biology of Reproduction},
215          volume = {74},
216          pages = {95-101},
217          year = {2006}
218  % Electroporation-assisted TMGT allows the expression of an exogenous sequence (in ~
     10\% of all sperm) for as long as 60 days following gene transfer (which suggests
     that the transgene may have integrated into the sperm genomic DNA, because the
     hamster spermatogenic cycle is approximately 35 days) with no significant long-term
     adverse effects on testicular integrity and sperm quality. Success might be
     attributable to injecting the DNA directly into the rete testis rather than into the
     testis or by intratubular injection.
219  }
220  @Article{Lavitrano06,
221          author = {Lavitrano et al.},
222          title = {{Sperm-mediated gene transfer}},
223          journal = {Reproduction, Fertility and Development},
224          volume = {18},
225          pages = {19-23},
226          year = {2006}
227  % Overall frequency of transgenic offspring using SMGT is in the range of 5–60\%
     against 0.5–4\% using microinjection, while the cost for SMGT is <US\$1000 against US\
     $25000 for single transgenic expressor by microinjection. Up to three genes
     (EGFP,EBFP,DsRed2 in example) can be transfered at once, with transgene expression in
     88\% of blastocysts, 18/18 animals expressing >1 gene, 4/18 expressing 1 gene, 7/18
     expressing 2, 7/18 expressing 3.
228  % A supplementray technique is restriction enzyme-mediated integration (REMI) where
     sperm transfection is achieved with liposomes containing linearised plasmid molecules
     having cohesive ends and the restriction enzyme used for the linearisation that
     mediates significant genomic rearrangements. Electroporation allows the sperm cells
     to take up more DNA molecules than normal, but does not yield a higher percentage of
     'transfected' cells, increase the handling stress to sperm cells, and DNA-overloaded
     sperm perform less efficiently compared with spermatozoa carrying an 'optimum'
     quantity of DNA (500ng/10E+6sperm)
229  }
230  @Article{Manzini06,
231          author = {Manzini et al.},
232          title = {{Genetically modified pigs produced with a nonviral episomal
     vector}},
233          journal = {PNAS},
234          volume = {103},
235          pages = {17672-17677},
236          year = {2006}
237  % Scaffold-matrix attachment region-based vectors are nonviral expression systems
     that replicate autonomously in mammalian cells and can be used in SMGT. Episomality
     of the plasmid prevents integration of the plasmid into the genome of sperm cells and
     subsequently in the cells of the individuals. Production of GM progeny is as
     efficient as with linearized plasmids. The high percentage of transgene-expressing
     cells (all tissues analyzed in positive animals, with an average 79\% of transgene-
     positive cells) and the absence of mosaicism render this technique safe and reliable.
238  }
239  @Article{Palffy06,
240          author = {Palffy et al.},
241          title = {{Bacteria in gene therapy: bactofection versus alternative gene
     therapy}},
242          journal = {Gene Therapy},
243          volume = {13},
244          pages = {101-105},
245          year = {2006}
246  % Cf Table 1 and Figure 1. Bactofection: bacteria are used as a vehicle/vector to
     transport the genetic information into the eukaryotic cell which express it.
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Alternative gene therapy: transformed bacteria produce the therapeutical polypeptide
in situ in the cells or in the intercellular space.
}
@PhDThesis{Epperly07,
        title = {{Linker-based sperm mediated gene transfer method for the production
of transgenic rat}},
        author = {Epperly,Jeannie M.},
        year = {2009},
        school = {The Graduate Faculty of the University of Akron}
% }
}
@Article{Humphris07,
        author = {Elisabeth L. Humphris and Tanja Kortemme},
        title = {{Design of Multi-Specificity in Protein Interfaces}},
        journal = {PLoS Computational Biology},
        volume = {3(8)},
        pages = {e164},
        year = {2007}
% Computational methods allow to design molecules with novel functions. A new
computational design procedure predicts protein sequences optimized to bind to a set
of targets, and provides a starting point to engineer designer molecules that could
modulate or replace naturally occurring protein interaction networks. Two distinct
patterns arise, a "shared" mode where all partners bind to only a subset of native
amino acid, and a   In the simplest case, all partners share key interactions, and a
"multi-faceted" or "network hub" mode where each partner prefers its own binding site
on the molecule.
}
@Article{Maeder08,
        author = {Maeder et al.},
        pages = {294-301},
        title = {{Rapid Open-Source Engineering of Customized Zinc-Finger Nucleases
for Highly Efficient Gene Modification}},
        journal = {Molecular Cell},
        volume = {31},
        year = {2008}
% Custom-made zinc-finger nucleases (ZFNs) can induce targeted genome modifications
with high efficiency. The OPEN (Oligomerized Pool ENgineering) method is a rapid and
publicly available strategy to generate highly specific engineered zinc-finger
nucleases, more effectively than current modular assembly approaches. OPEN selections
are performed in E. coli and do not require specialized equipment.
% However, using ZFNs to modify genes has limitations : First, not all zinc-finger
arrays that possess sequence-specific DNA-binding activities will function as ZFNs in
cells. Second, although the use of vinblastine increased the frequency of gene
targeting, DNA sequencing reveals that many alleles still underwent insertions or
deletions caused by error-prone NHEJ and that some alleles underwent both a gene
targeting event and an insertion. DNA sequencing should always be performed to verify
ZFN-induced gene targeting events.
}
@Article{Shao09,
        author = {Shao et al.},
        title = {{DNA assembler, an in vivo genetic method for rapid construction of
biochemical pathways}},
        journal = {Nucleic Acids Research},
        volume = {37},
        pages = {e16},
        year = {2009},
        doi = {10.1093/nar/gkn991}
% A new method called DNA assembler allows the assembly of an entire biochemical
pathway (up to 19 kb with 8 genes)with high efficiencies (70–100\%) either on a
plasmid or on a yeast chromosome. The assembly can be done in a single step, via
simple DNA preparation and in vivo homologous recombination in yeast. Conceptually, a
long sequence can be split into several segments that will be sequentially integrated
into the chromosome by using a recyclable selection marker. Once a segment is
integrated, 5-fluoroorotic acid can be used to remove the marker so that another
segment can be integrated subsequently. A sequence of 30-50 genes (around 100-200 kb)
could be integrated to the yeast chromosome within several weeks, but high-fidelity
polymerases like Phusion (with a error rate at 4.4E-7) should be used to greatly
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reduce the mutation frequency.
}
@Article{Jang10,
        author = {Jang et al.},
        title = {{Current status and applications of somatic cell nuclear transfer in dogs}},
        journal = {Theriogenology},
        volume = {74},
        pages = {1311-1320},
        year = {2010}
% SCNT research can help us to expand or select genetic high performance in dogs, but its use has advanced only slowly. The main causes are the very low efficiency of dog oocyte maturation in vitro (0-25\% compared to 70-80\%) and the problematic fusion of the reconstructed oocytes (3.3-4.0 kV/cm is necessary compared to 1.5-2.0 kV/cm). In addition, non-surgical access to the uterus for artificial insemination or embryo transfer is technically difficult and requires expensive laparoscopic equipment. Dog oocytes are ovulated at the germinal vesicle (immature) stage and require 48-72 h in the oviducts for final maturation to metaphase II.
}
@Article{Brunstein11,
        author = {John Brunstein},
        title = {{The quest for the \$500 home molecular biology laboratory}},
        journal = {Medical Laboratory Observer},
        month = {December},
        pages = {26-29},
        year = {2011},
        url = {http://www.mlo-online.com/articles/201112/the-quest-for-the-500-home-molecular-biology-laboratory.php}
% The challenge was to assemble a home molecular biology laboratory with (1) \$500 of equipment budget, reagents and consumables not included. (2) little or no requirement to build or adapt devices (3) the ability to run multiple sample types for a range of assays, with sensitivity and speed generally comparable to a "real" academic lab. (4) reagents and supplies safe for home use (5) everything obtained through channels available to the average person. The quest was successful, thanks to the widespread and increasing availability of second-hand professional laboratory equipment or inexpensive new commercial surrogates means.
}
@Article{Izmiryan11,
        author = {Izmiryan et al.},
        title = {{Efficient gene targeting mediated by a lentiviral vector-associated meganuclease}},
        journal = {Nucleic Acids Research},
        pages = {1-10},
        year = {2011},
        doi = {10.1093/nar/gkr524}
% Gene targeting can be achieved with lentiviral vectors delivering donor sequences along with a nuclease that creates a locus-specific double-strand break. The nuclease can be transferred into cells as a protein associated with a lentiviral vector particle. Delivery of the meganuclease as a protein leads to gene targeting with a frequency of recombination 2-fold higher (and a potentially safer approach) than with the nuclease encoded by a separate vector.
}
@Article{Kazuki11,
        author = {Kazuki et al.},
        pages = {384-393},
        title = {{Refined human artificial chromosome vectors for gene therapy and animal transgenesis}},
        journal = {Gene Therapy},
        volume = {18},
        year = {2011}
% Human artificial chromosomes have a stable episomal maintenance and the ability to carry large gene inserts, but remaining endogenous genes limit their therapeutic applications. A HAC vector without endogenous genes can be refined from human chromosome 21 in homologous recombination-proficient chicken DT40 cells. Any desired gene can be cloned into the HAC by a combination of Cre-loxP-mediated chromosome translocation and telomere-directed truncation. The HAC can be efficiently transferred via microcell-mediated chromosome transfer (MMCT) and stably maintained
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    in vitro and in vivo. If a HAC carries the suicide gene herpes simplex virus
    thymidine kinase (HSV-TK), cells containing it can be selectively killed by
    ganciclovir.
320 }
321 @Article{Jinek12,
322         author = {Jinek et al.},
323         title = {{A Programmable Dual RNA–Guided DNA Endonuclease}},
324         journal = {Science},
325         volume = {337},
326         pages = {816-821},
327         year = {2012}
328 % CRISPR-Cas systems constitute a DNA interference mechanism that directs a Cas9
    endonuclease to introduce site-specific double-stranded breaks in target DNA. This
    endonuclease can be programmed with a DNA target-binding sequence in a  chimeric
    guide RNA to target and cleave any dsDNA sequence of interest. The system is
    efficient, versatile, and could complete Zinc-finger nucleases (ZFN) and
    transcription-activator–like effector nucleases (TALEN) as artificial enzymes
    engineered to manipulate genomes.
329 }
330 @Article{Koga12,
331         author = {Koga et al.},
332         title = {{Principles for designing ideal protein structures}},
333         journal = {Nature},
334         volume = {491},
335         pages = {222-227},
336         year = {2012}
337 % A new approach, based on a set of rules relating secondary structure patterns to
    protein tertiary motifs, was developped to design ideal protein structures stabilized
    by completely consistent local and non-local interactions. This makes possible the
    optimisation of protein folding energy landscapes leading into the wanted target
    folded state and provides the foundation for engineering a new generation of
    functional proteins free from natural evolution.
338 }
339 @Article{Llosa12,
340         author = {Llosa et al.},
341         title = {{New perspectives into bacterial DNA transfer to human cells}},
342         journal = {Trends in Microbiology},
343         volume = {20},
344         pages = {355-359},
345         year = {2012}
346 % The Type IV secretion system (T4SS) present in several intracellular pathogenic
    bacteria can be used to transfer 100-1000 kbp of DNA (genes + regulatory sequences)
    into specific cell types, along a variety of proteins (site-specific integrase)
    leading to efficient chromosomal integration. The fact that assisting proteins can be
    transferred with the DNA from the bacteria, in place of expressing them in the
    recipient cell, minimizes toxicity problems. Because each pathogen targets different
    cellular types, tropism could be acquired by selecting the appropriate T4SS-encoding
    bacterium depending on the tissue to be targeted.
347 }
348 @Article{Sanjana12,
349         author = {Sanjana et al.},
350         pages = {171-192},
351         title = {{A transcription activator-like effector toolbox for genome
    engineering}},
352         journal = {Nature Protocols},
353         volume = {7},
354         year = {2012}
355 % Transcription activator-like effectors (TALE) are DNA-binding proteins with a
    binding domain consisting of tandem 34-amino acid repeat modules that can be
    rearranged to target new DNA sequences. A method was established for rapid
    construction (< 1 week) of custom transcription factors and nucleases using a
    hierarchical ligation procedure. There are a few limitations with this technology :
    different TALEs designed according to the same cipher act with different levels of
    activity on the same target site, and engineered TALEs can have off-target effects
    (binding unintended genomic loci) which can be difficult to detect without additional
    functional assays at these loci.
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}
@Article{Vajta12,
        author = {Vajta et al.},
        title = {{Establishment of an efficient somatic cell nuclear transfer system for production of transgenic pigs}},
        journal = {Theriogenology},
        volume = {77},
        pages = {1263-1274},
        year = {2012}
% Handmade cloning (HMC) is a SCNT procedure that does not require expensice and delicate micromanipulators and constitute a competitive, inexpensive and reliable alternative to traditional cloning techniques. The task can be performed by a small "core team" of 7-9 researchers and technicians.
}
@Article{Cong13,
        author = {Cong et al.},
        title = {{Multiplex Genome Engineering Using CRISPR-Cas Systems}},
        journal = {Science},
        volume = {339},
        pages = {819-823},
        year = {2013}
% Multiple RNAs guide sequences (to induce site-specific DNA cleavage) can be encoded into a single CRISPR array to enable simultaneous editing of several sites within the mammalian genome, with easy programmability and wide applicability.
}
@Article{Jakobsen13,
        author = {Jakobsen et al.},
        title = {{Generation of minipigs with targeted transgene insertion by recombinase-mediated cassette exchange (RMCE) and somatic cell nuclear transfer (SCNT)}},
        journal = {Transgenic Research},
        volume = {22},
        pages = {709-723},
        year = {2013}
% Recombinase-mediated cassette exchange (RMCE) is a method allowing targeted integration of a transgene in a pre-selected transcriptionally active genomic site. Using minicircles in RMCE removes the requirement for a negative selection marker, as random integration of minicircles will separate the positive selection marker from the promoter, disrupt expression of the marker and kill the non-RMCE cells.
}
@Article{Jinek13,
        author = {Jinek et al.},
        title = {{RNA-programmed genome editing in human cells}},
        journal = {eLife},
        volume = {2},
        pages = {e00471},
        year = {2013},
        doi = {10.7554/eLife.00471}
% RNA-programmed genome editing is a facile strategy for introducing site-specific double-strand DNA breaks in human cells. RNA expression and/or assembly into Cas9 is the limiting factor for Cas9-mediated DNA cleavage, but extension of the RNA sequence at the 3' end enhances DNA targeting activity in vivo.
}
@article{Kamimura13,
        author = {Kamimura et al.},
        title = {Mouse Cloning Using a Drop of Peripheral Blood},
        journal = {Biology of Reproduction},
        volume = {89},
        number = {2},
        pages = {24-30},
        year = {2013},
        doi = {10.1095/biolreprod.113.110098}
% A drop of peripheral blood (15-45 µl) can be enough to succesfully clone an animal, even if infertile or "last-of-line". Using leukocytes, granulocytes/monocytes and lymphocytes nuclei lead to a birth rate of 2.8\%, and 2.1\% and 1.7\% repectively. The use of lymphocyte nuclei inevitably results in the birth of offspring with DNA rearrangements.
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}
@Article{Uno13,
        author = {Uno et al.},
        title = {{The transfer of human artificial chromosomes via cryopreserved microcells}},
        journal = {Cytotechnology},
        volume = {65},
        pages = {803-809},
        year = {2013}
% Microcell-mediated chromosome transfer (MMCT) works with a single chromosome or megabase-sized fragments, but must be performed immediately after the purification of microcells in the conventional method. A protocol for cryopreservation storage of microcells at -80°C has been established and shows no significant difference regarding chromosome transfer efficiency and retention rate of HAC.
}
@Article{Wakayama13,
        author = {Wakayama et al.},
        title = {{Successful Serial Recloning in the Mouse over Multiple Generations}},
        journal = {Cell Stem Cell},
        volume = {12},
        pages = {293-297},
        year = {2013}
% Serial cloning generally shows a decrease in efficiency over repeated iterations and a failure after a few generations. However, reliable repeated recloning through SCNT can be achevied by using a histone deacetylase inhibitor (trichostatin A) with no decrease - but no increase - of the cloning efficiency over 25 generations.
}
@Article{Arav14,
        author = {A. Arav},
        title = {{Cryopreservation of oocytes and embryos}},
        journal = {Theriogenology},
        volume = {81},
        pages = {96-102},
        year = {2014}
% Standardization of cryopreservation techniques and an automatic embryo vitrification procedure are currently under development. The next evolutionary step will be preserving them in the dry state at room temperature, allowing home storage for future use a reality.
}

% ============================
% Dossier "Droit-éthique"       (19 articles)

@Article{Kolber01,
        author = {Adam Kolber},
        title = {{Standing Upright: The Moral and Legal Standing of Humans and Other Apes}},
        journal = {Stanford Law Review},
        volume = {54},
        pages = {163-204},
        year = {2001}
% This policy proposal restricts the discussion of great ape personhood to a much less ambitious legal issue in the law of standing, more specifically the argument that great apes should be granted standing to bring lawsuits, through a human guardian, under the Animal Welfare Act (AWA). It does not require us to accept arguments about ape personhood but merely requires recognition of certain obligations to protect animal interests.
}

% 2003_Ankeny_The Interplay between Morality and Science in Debates over Embryonic Chimeras.pdf
% 2003_Castle_Hopes against Hopeful Monsters.pdf
% 2003_Chakrabarty_Crossing Species Boundaries and Making Human-Nonhuman Hybrids Moral and Legal Ramifications.pdf
% 2003_Glenn_A Legal Perspective on Humanity Personhood and Species Boundaries.pdf
% 2003_Greely_Defining Chimeras and Chimeric Concerns.pdf
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% 2003_Karpowicz_In Defense of Stem Cell Chimeras A Response to Crossing Species Boundaries.pdf
% 2003_Resnik_Patents on Human-Animal Chimeras and Threats to Human Dignity.pdf
% 2003_Robert_Crossing Species Boundaries.pdf
% 2003_Robertson_A Response to Crossing Species Boundaries.pdf
% 2003_Rollin_Ethics and Species Integrity.pdf
% 2003_Sagoff_Transgenic Chimeras.pdf

@Article{Savulescu03,
        author = {Julian Savulescu},
        title = {{Human-Animal Transgenesis and Chimeras Might Be an Expression of Our Humanity}},
        journal = {American Journal of Bioethics},
        volume = {3},
        number = {3},
        pages = {22-25},
        year = {2003}
% Based on a utilitarist viewpoint, the creation of chimeras and uplifts could help humanity in terms of fundamental or translational medecine, while making a human-animal chimera is much less controversial when done for medical purposes than for entertainment or art. One necessary but not suffisant condition of humanity is is the capacity to act on normative reasons and display practical rationality. When we act according to what we have good reasons to do, we express our humanity. Only genetic modifications that decrease reasoning capabilities or undermines the expression of our humanity constitute a threat.We sould not base social policy and law on moral confusions, especially when they can harm people.
}

% 2003_Siegel_The Moral Insignificance of Crossing Species Boundaries.pdf
% 2003_Streiffer_In Defense of the Moral Relevance of Species Boundaries.pdf
% 2003_Thompson_Crossing Species Boundaries Is Even More Controversial than You Think.pdf

@PhDThesis{Bourzac04,
        author = {Katherine Anne Bourzac},
        title = {{Across the Great Divide: Chimeras and species boundaries}},
        year = {2004},
        school = {Massachusetts Institute of Technology},
%
}
@Article{Bennett06,
        author = {Scott Bennett},
        title = {{Chimera and the continuum of humanity: erasing the line of constitutional personhood}},
        journal = {Emory Law Journal},
        volume = {55},
        pages = {347-387},
        year = {2006}
% this Comment provides a framework for determining if and when the U.S. Constitution and the rights it confers should even be applicable to chimera and chimera research. Varying levels of constitutional protection should be afforded to chimera based on a two-dimensional sliding scale approach, which is not unheard of: the Supreme Court already grants less than full constitutional protection to children, prisoners, and noncitizens. The indicators of constitutional personhood should be the capacity for higher-level human cognition and the percentage of human tissue. Four loose categories could be applied: (1) high/high like humans with xenotransplants => full rights (2) none/low like spider goats => no additional rights (3) medium/medium like human-chimpanzee chimera => full rights unless not sapient enough (4) low/high like xenotransplant pigs => limited rights.
}
@Article{Broom06,
        author = {Donald Maurice Broom},
        title = {{The evolution of morality}},
        journal = {Applied Animal Behaviour Science},
        volume = {100},
        pages = {20-28},
        year = {2006}
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% The success of complex animal societies depends on minimizing harm and collaboration. In order to promote this, a moral structure inevitably develops (cf. table 1) hence morality has evolved in humans and in many other species. A sentient being is one that has some ability: to evaluate the actions of others in relation to itself and third parties, to remember some of its own actions and their consequences, to assess risk, to have some feelings and to have some degree of awareness. Amongst sentient animals, coping with adversity may be more difficult in those with less sophisticated brain processing, because more complex brains could allow more possibilities for pleasure which contributes greatly to good welfare. A utilitarian approach is not sufficient to determine all obligations, however, and a deontological approach is also needed because there are some degrees of poor welfare which are never justified by benefit to others.
}
@Article{Degrazia07,
        author = {David Degrazia},
        title = {{Human-Animal Chimeras: Human Dignity, Moral Status, And Species Prejudice}},
        journal = {MetaPhilosophy},
        volume = {38},
        pages = {309-329},
        year = {2007}
% Person = kind of being picked out by certain psychological traits or capacities, with complex forms of consciousness such as self-awareness over time, sociability, and rationality. Language training is important both because linguistic competence is a criterion associated with personhood and because language seems to extend a being’s conceptual reach and, with it, certain other cognitive capacities.
% - Unequal Consideration Model : it is generally worse to kill persons than animals because the former are due full moral consideration whereas the latter are due some but less consideration. This model is a gradualist sliding-scale, according to which sentient nonpersons deserve consideration in proportion to their cognitive, emotional, and social complexity.
% - Unequal Interests Model : it is generally worse to kill persons than animals because the equal consideration to which persons and animals are entitled gives equal moral weight ONLY to comparable interests. This model holds that all sentient beings deserve equal consideration, but that significant prudential differences between persons and sentient nonpersons justify attributions of unequal moral status.
% The reation of human-ape chimera or hybrids should be prohibited because the apes' (beings with full moral status) interests would be subordinated to human social utility and harmed without compensating benefit. However, there is no intelligible reason that increasing the number of individuals with full moral status would threaten the moral status of Homo sapiens persons or human dignity any more than the constant increase in our species’ population.
}
@Article{Rai07,
        author = {Rai et al.},
        title = {{Synthetic Biology: Caught between Property Rights, the Public Domain, and the Commons}},
        journal = {PLoS Biology},
        volume = {5},
        number = {3},
        pages = {e58},
        year = {2007}
% The MIT scientists involved with the Registry of Standard Biological Parts have created the BioBricks Foundation, which might serve to coordinate a synthetic biology "commons" drawing inspiration from the open source software model. The  Biological Innovation for an Open Society (BIOS) group is using patent protection on a few key plant gene transfer technologies to force licensees to put improvements to those technologies into the commons.}
}
@Article{Allhoff08,
        author = {Fritz Allhoff},
        title = {{Germ-Line Genetic Enhancement and Rawlsian Primary Goods}},
        journal = {Journal of Evolution and Technology},
        volume = {18},
        pages = {10-26},
        year = {2008}
% Using quasi-statistical concepts of 'normality', one can argue that any
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intervention designed to restore or preserve a species-typical level of functioning for an individual count as therapy, whereas giving individuals capabilities beyond the range of normal variation constitute enhancement. Several arguments have been presented against genetic intervention (unjust outcomes due to inequal distribution, enhanced accomplishments less laudable, failure to accept our place in nature) but can be rejected as unrelated to the enhancement itself or only contingently valid given scientific limitations.
528 % Primary goods are things that every rational person should value, regardless of his conception of the good or his life goals (rights, liberties, opportunities, wealth, health, intelligence, imagination...) and that it would be irrational to turn them down when offered. Certain forms of germ-line enhancements can be morally permissible if and only if they augment Rawlsian primary goods, either directly or by facilitating their acquisition.}
529 }
530 @Article{Cooley08,
531         author = {Dennis R. Cooley},
532         title = {{Genetically Engineering Human-Animal Chimeras and Lives Worth Living}},
533         journal = {Between The Species},
534         volume = {13},
535         number = {8},
536         pages = {1-19},
537         year = {2008}
538 % Work on lives worth living for human beings (following an utilitarian and essentialist framework in regards to personal identity) can provide valuable insight into the morality of creating chimeras. The benefit of one action should be compared to the benefits accrued through alternative acts to determine if an agent is actually benefitted by the original action. Causing someone to exist is a special case because the alternative would not have been worse for this person, so it cannot be better for this person but it may be good. Since it is impossible to injure something that never exists, it would not be better for chimeras to never have existed rather than being subject to exploitation. As long as their lives are overall worth living, bringing them into existence does not harm them even if they are used for medical research or procedures, or they are created to carry on the homo sapiens' "family" line. See Eric Sotnak's "Nonhuman Chimeras with Human Brain Cells."
539 }
540 @Article{Dvorsky08,
541         author = {George Dvorsky},
542         title = {{Developmental and ethical considerations for biologically uplifting nonhuman animals}},
543         journal = {Journal of Evolution and Technology},
544         volume = {18},
545         pages = {129-142},
546         year = {2008}
547 % Civilizational progress necessarily implies increasing levels of organization and refinement across all realms of activity, so the status of nonhuman species will eventually come under the purview of guided intelligence rather than autonomous processes. Given the animal rights movement's goal to increase the moral circle to include higher animals, and given the strong scientific case in favour of animal personhood, it would be unethical, negligent and even hypocritical of humans to enhance only themselves and ignore the larger community of sapient nonhuman animals that is left behind to fend for itself. Efforts could be made to endow nonhuman animals with the requisite cognitive and social skills that will enable individual and group self-determination, and allow participation in the larger social politic that includes all sentient life.
548 % Applying Rawlsian moral frameworks to the acknowledgement of legally recognized nonhuman persons, the presence of uplift biotechnologies will represent a new primary good and thus necessitate the inclusion of highly sapient nonhumans into the human society. Interventions designed to deliberately constrain a sentient organism such that it is incapable of empowered participation in the broader social community is grossly unethical and should be considered illegal. The ultimate goal of animal uplift is the creation of equal social partners and not a species to be subjugated.
549 % The Rawlsian notion of original position (individuals decide principles of justice from behind a veil of ignorance, adopting a risk-minimizing strategy that would maximize the position of the least well off) can answer the question of whether or not there is consent to uplift. Considering that nonhumans are completely shut-out from the social contract and carry negligible social standing, they should be
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considered among the most least-advantaged. The prospect of coming into the world as a great ape, elephant or dolphin in the midst of an advanced human civilization can be reasonably construed as a worst outcome. Therefore, humanity can assume that it has the consent of sapient nonhumans to biologically uplift them.
% The idea that nonhumans should be uplifted so that they more closely resemble Homo sapiens has been interpreted as a rather anthropocentric perspective. As already stated, the goal is not to transmutate animals in humans, but to improve their quality of life by endowing them with improved modes of functioning and increased health.
% The Great Ape Trust in Iowa is engaging in a multi-generational cultural uplift experiment, where the use of lexigrams and touch-sensitive computer allow to overcome biological limitations in matters of vocal production. However, bonobo psychology is intractably limited with their inability to consider abstract concepts such as past or future, to grasp syntax, and to display active teaching behaviours.
}
@Article{Etkind08,
        author = {Alexander Etkind},
        title = {{Beyond eugenics the forgotten scandal of hybridizing humans and apes}},
        journal = {Studies in History and Philosophy of Biological and Biomedical Sciences},
        volume = {39},
        pages = {205-210},
        year = {2008}
% Three hypothetical reasons can be advanced for Ivanov's attemp at hybridization between humans and apes : (1) it would support the atheist propaganda of the Bolsheviks in favour of evolution (2) it would bring help bring apes to Russia, which were necessary for the rejuvenation programs fashion able among the Bolshevik elite (3) it would pave the way to the New Socialist Man whose 'construction by scientific means' as the official purpose of the Bolsheviks. In addition, Ivanov and Sergei Voronov transplanted a woman’s ovary into a female chimp and inseminated her with human sperm, but the ape died.(Shishkin, 2003, p. 172)
% The American Association for the Advancement of Atheism asserted that the objective of Ivanov’s experiments in Africa was to accomplish 'artificial insemination of the human and anthropoid species, to support the doctrine of evolution, by establishing close kinship between man and the higher apes'. But it developed an essentially new, racist version of the hybridization project partially based on Hermann Klaatsch's 'polyphyletic' theory that human races derive from different species of apes so that hybrids between humans and apes can be produced and would be fertile.
}
@Article{Sherringham08,
        author = {Tia Sherringham},
        title = {{Mice, Men, and Monsters: Opposition to Chimera Research and the Scope of Federal Regulation}},
        journal = {California Law Review},
        volume = {96},
        pages = {765-800},
        year = {2008}
% The most ethically questionable research concerning chimera involves implanting stem cells derived from the human brain or eye into animal embryos, because people become most uncomfortable when the boundaries between what is human and what is animal are blurred. According to some ethicists, an instinctive queasiness or repugnance ("Yuck factor") provide sufficient basis to conclude that chimera research is morally unacceptable. However, emotions are a questionable basis for moral decision making if there is no articulation of the underlying emotion and therefore a difficulty to persuade others to share his sentiment.
% Two objections based by animal welfare are : (1) human neural cells may confer increased mental aptitude to the animal subjects and lead to greater capacities to experience pain (2) current conditions may be inadequate to protect chimeras if they can experience human-like pain. But the state of the science does not require more than a case-by-case analysis and the existing regulatory system has jurisdiction to oversee chimera technology.
% The Human Chimera Prohibition Act of 2005 (not adopted) forth three reasons to prohibit the creation of chimeras : (1) to prohibit the most "ethically challenging human-animal hybrids" (2) to avoid the emerging threat of animal-to-human disease infection (3) to prohibit science that compromises human dignity by blurring the lines between animals and humans. The legislation purports to ban eight categories :

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(a) human embryos that are not fully human, (b) human eggs fertilized with animal sperm, (c) animal eggs fertilized with human sperm, (d) human eggs with an animal nucleus, (e) animal eggs with a human nucleus, (f) eggs with both human and animal chromosomes, (g) animals with human reproductive organs, and (h) animals with human brains.
}
@Article{Bostrom09,
        author = {Nick Bostrom and Anders Sandberg},
        title = {{Cognitive enhancement: Methods, Ethics, Regulatory challenges}},
        journal = {Sci. Eng. Ethics},
        volume = {15},
        pages = {311-341},
        year = {2009}
% Cognitive enhancement technologies raise a range of ethical issues and create challenges for public policy and regulation. Listed objections are safety, the purpose of medicine, procreative choice and eugenics, authenticity of achievements, playing god and the status quo, cheating and positional goods, inequality.
% Modified mice to produce more NR2B subunits of the NMDA receptor (which is gradually replaced by NR2A subunits during animal maturation and might be linked to lower brain plasticity) showed improved memory performance, in terms of both acquisition and retention, including unlearning of fear conditioning. But the modification made them more sensitive to certain forms of pain, suggesting a non-trivial trade-off between two potential enhancement goals. Increased amounts of the signal transduction protein adenylyl cyclase also produced improvements in recognition memory, but not improved context or cue learning.
% Administration of choline supplements and long chained fatty acids to pregnant and postpartum mothers has also been shown to improve cognitive performance, apparently as a result of changes in neural development.
}
@PhDThesis{Huther09,
        title = {{Chimeras: The Ethics of Creating Human-Animal Interspecifics}},
        author = {Constanze Huther},
        year = {2009},
        school = {Ludwig-Maximilians-Universität (Munich)}
%
}
@Article{Samuel09,
        author = {Samuel et al.},
        title = {{Regulatory responses to the challenges posed by synthetic biology and synthetic genomics}},
        journal = {EMBO Reports},
        volume = {10},
        pages = {7-11},
        year = {2009}
% Progress in science and technology often outpaces the relevant ethical, legal and moral discourse and regulation, which can create suspicion and backlash from the public. To avoid this, it is imperative that the ethical and regulatory issues surrounding synthetic genomics and synthetic biology are identified, analysed and addressed sooner rather than later. More education and awareness, both within the scientific community and in the public sphere, could help to prevent a backlash of public opinion in the future. Prohibition would inhibit intellectual inquiry and scientific freedom, and would prevent any possible benefits from synthetic genomics and synthetic biology being realized.
}
@Article{Coors10,
        author = {Coors et al.},
        title = {{The Ethics of Using Transgenic Non Human Primates to Study What Makes Us Human}},
        journal = {Nat Rev Genet.},
        volume = {11},
        pages = {658-662},
        year = {2010}
% An ongoing flood of comparative genomic data is identifying human lineage specific (HLS) sequences of unknown function, and there is strong interest in investigating their functional effects. Pursuing transgenic research on HLS sequences could provide important information on what makes members of Homo sapiens different from apes, and also produce clinical benefits given that HLS variants have been found to be
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disproportionately enriched in genomic locations implicated in human diseases. But biomolecular systems are interdependent and most genes have multiple seemingly unrelated functions, so a transfer could have a wide array of unexpected and/or deleterious effects.
% A transgenic chimp with mixed features is likely to be ill-suited for both the human and chimp worlds, unable to socialize successfully with either species. At the far end of the spectrum are cognitive changes that might give transgenic apes enough selfawareness to appreciate the ways their lives are circumscribed and to suffer psychological harm. These uncertainties raise the risk of producing unanticipated harm to transgenic NHPs and render the conduct of this research ethically unacceptable in apes.
}
@TechReport{Ipsos10,
        author = {Castell et al.},
        title = {{Exploring the Boundaries: Report on a public dialogue into Animals Containing Human Material}},
        institution = {Ipsos MORI},
        month = {September},
        year = {2010}
%
}
@TechReport{AMS11,
        author = {Bobrow et al.},
        title = {{Animals containing human material}},
        institution = {The Academy of Medical Sciences},
        year = {2011}
%
}
@Article{Wise11,
        author = {Steven M. Wise},
        title = {{Legal personhood and the Nonhuman Rights Project}},
        journal = {Animal Law},
        volume = {17},
        year = {2011},
        url = {https://www.lclark.edu/live/files/8137-171-wise}
% Legal things, living and inanimate, exist in law solely for the sakes of legal persons. Only legal persons can be legally seen, for only they exist in law for their own benefits. A possible "Animal Rights Pyramid" has four levels : (1) Legal personhood (2) Possession of legal rights, among them may be the power to sue and bodily integrity/liberty (3) Private right of action bestowed by statute/constitution/ treaty/common law and exercised in person or by proxy (4) Legal Standing, i.e. a sufficient stake in an otherwise justiciable controversy to obtain judicial resolution of that controversy. If an animal have not yet been declared to be Level 1 legal persons, they have no Level 2 legal rights, and lack the Level 3 capacity to sue, therefore the question of Level 4 standing should not be discussed.
% Currently all humans are legal persons while all nonhuman animals are legal things. The goal of the interdisciplinary Nonhuman Rights Project is to change this paradigm. For example, might the ancient procedure of manumission, by which a master could free his slave through his private action, apply to any nonhuman animal ?
}

% ============================
% Dossier "Évolution cérébrale" (43 articles)

@Article{Hof01,
        author = {Hof et al.},
        title = {{An unusual population of pyramidal neurons in the anterior cingulate cortex of hominids contains the calcium-binding protein calretinin}},
        journal = {Neuroscience Letters},
        volume = {307},
        pages = {139-142},
        year = {2001}
% an unusual population of pyramidal neurons has been found with the following features :
% - restricted to the superficial part of layer V in the anterior cingulate cortex
% - characterized by immunoreactivity to the calcium-binding protein calretinin
% - rare in orangutans, numerous in gorillas, common in chimps, most frequent in
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humans
% - not observed in any other primate or mammalian species
% The appearance of these neurons may reflect the recent evolution of this cortical area in the only mammalian lineage to have developed articulated language and its emotional implications.
}
@Article{Kingsbury03,
        author = {Kingsbury et al.},
        title = {{Non-proliferative effects of lysophosphatidic acid enhance cortical growth and folding}},
        journal = {Nature Neuroscience},
        volume = {6},
        pages = {1292-1299},
        year = {2003}
% Lysophosphatidic acid (LPA) has extracellular signaling properties mediated by two G protein–coupled receptors, LPA1 and LPA2, that are expressed in the embryonic cerebral cortex. Intact cerebral cortices exposed to extracellular LPA ex vivo rapidly increased in thickness by 30% and produced folds resembling gyri in up to 85% of cases. Growth was not due to increased proliferation but rather to receptor-dependent reduced cell death and increased terminal mitosis of neural progenitor cells.
}
@Article{Evans04,
        author = {Evans et al.},
        title = {{Adaptive evolution of ASPM, a major determinant of cerebral cortical size in humans}},
        journal = {Human Molecular Genetics},
        volume = {13},
        pages = {489-494},
        year = {2004}
% The Abnormal SPindle-like Microcephaly associated gene underwent an intense positive selection and strong adaptive evolution (advantageous amino acid changes at 1/300-400kA since 5-6Mya) since the human lineage diverged, which is consistent with its putative role in the evolutionary enlargement of the human brain.
% There is currently no direct data on the biochemical function of ASPM in mammals, but the drosophile homolog have shown a critical function in organizing the mitotic and meiotic spindle structures. Regulation of the proportions of symmetric versus asymmetric cell divisions in the proliferating neuroepithelium has a profound impact on the final size of the cerebral cortex, with higher proportions of symmetric divisions corresponding to larger cortex.
}
@Article{Price04,
        author = {David J. Price},
        title = {{Lipids make smooth brains gyrate}},
        journal = {TRENDS in Neurosciences},
        volume = {27},
        pages = {362-363},
        year = {2004}
% Unpdate to Kingsbury03 : phospholipids are potential contributors to the control of cerebral cortical size. The hypothesis is that mechanisms intrinsic to the cortical sheet itself generate complex patterns of sulci and gyri in response to an increase in cortical cell number.
}
@Article{Stedman04,
        author = {Stedman et al.},
        title = {{Myosin gene mutation correlates with anatomical changes in the human lineage}},
        journal = {Nature},
        volume = {428},
        pages = {415-418},
        year = {2001}
% The masticatory muscles of humans are considerably smaller than those of apes, and underwent gracilization nearly simultaneously with accelerated encephalization in early Homo. The myosin heavy chain (MYH16) gene expressed in these muscles was inactivated by a frameshifting mutation that appeared ~2.4 Mya, according to the molecular clock based on the coding sequence for the myosin rod domains.
}
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@Article{Herculano05,
        author = {Herculano-Houzel et al.},
        title = {{Isotropic Fractionator: A Simple, Rapid Method for the Quantification of Total Cell and Neuron Numbers in the Brain}},
        journal = {The Journal of Neuroscience},
        volume = {25},
        number = {10},
        pages = {2518-2521},
        year = {2005}
% We developed a novel, fast, and inexpensive method to quantify total numbers of neuronal and non-neuronal cells in the brain. Estimates can be obtained in 24 h, vary by <10% among animals, and are independent of brain volume.
}
@Article{Perry05,
        author = {Perry et al.},
        pages = {379-382},
        title = {{Comparative Analyses Reveal a Complex History of Molecular Evolution for Human MYH16}},
        journal = {Molecular Biology and Evolution},
        volume = {22},
        year = {2005}
% The age of the human lineage–specific frameshift deletion of MYH15 is estimated at 5.3 Mya, against 2.4 Mya for Stedman04. In addidtion, conflicting estimates of nonsynonymous fixation rates across different regions of this gene reveal a complex pattern inconsistent with a simple model of pseudogene evolution. Although the human MYH16 downstream region is desactived (neutral evolution in the past 5 Myr) it is possible that the upstream region still remains active and functional (functional constraint) . These results question the idea that inactivation of MYH16 was associated with masticatory gracilization and an increased cranial capacity in the genus Homo.
}
@Article{Roth05,
        author = {Roth et al.},
        pages = {250-257},
        title = {{Evolution of the brain and intelligence}},
        journal = {Trends in Cognitive Science},
        volume = {9},
        year = {2005}
% Mental or behavioral flexibility is a good measure of intelligence, resulting in the appearance of novel solutions that are not part of the animal's normal repertoire. Factors that correlate better with intelligence are the number of cortical neurons and conduction velocity, as the basis for information-processing capacity. The outstanding intelligence of humans appears to result from a combination and enhancement of properties found in primates, such as theory of mind, imitation and language, rather than from 'unique' properties. Cf Table 1 for data on brain mass, # cortical neurons and EC for various animals, but check with Herculano-Houzel's estimates.
}
@Article{Toro05,
        author = {Toro et al.},
        title = {{A morphogenetic model for the development of cortical convolutions}},
        journal = {Cerebral Cortex},
        volume = {15},
        pages = {1900-1913},
        year = {2005}
% The developing brain is modelled as a growing closed surface, representing the cerebral cortex, pulled radially by fibres, representing radial glia and early axonal connectivity. The cerebral cortex and fibres are characterized by their elasticity and plasticity.
}
@Article{Balter07,
        author = {Michael Balter},
        title = {{Brain evolution studies go micro}},
        journal = {Science},
        volume = {315},
        pages = {1208-1211},
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734         year = {2007}
735 % Signs of human uniqueness could be found in microanatomical structures and
    enhancements in the wiring and connectivity of nerve cells that our ape cousins lack.
    For example, Von Economo neurons (rediscovered by Hof) may relay nerve impulses
    swiftly. Astrocytes trigger synapse formation by secreting thrombospondins and human
    express up to six times as much thrombospondin messenger RNA and protein than do
    either chimps or macaques.
736 }
737 @Article{Bruner07,
738         author = {Emiliano Bruner},
739         title = {{Cranial shape and size variation in human evolution: structural and
    functional perspectives}},
740         journal = {Childs Nerv Syst},
741         volume = {23},
742         pages = {1357-1365},
743         year = {2007}
744 % Cf Figure 4 for a structural network model of the evolution of the cranium shape.
745 }
746 @Article{Caceres07,
747         author = {Cáceres et al.},
748         title = {{Increased Cortical Expression of Two Synaptogenic Thrombospondins
    in Human Brain Evolution}},
749         journal = {Cerebral Cortex},
750         volume = {17},
751         pages = {2312-2321},
752         year = {2007}
753 % Thrombospondins are extracellular-matrix glycoproteins implicated in the control of
    synaptogenesis and neurite growth. Corresponding genes were upregulated during human
    brain evolution, with a 6-fold and ~2-fold greater expression of THBS4 and THBS2 RNAs/
    proteins in human cerebral cortex compared with chimpanzees and macaques. This
    increased expression could result in changes in synaptic organization and plasticity,
    and contribute to the distinctive cognitive abilities of humans, as well as to our
    unique vulnerability to neurodegenerative disease.
754 }
755 @Article{Deaner07,
756         author = {Deaner et al.},
757         title = {{Overall Brain Size, and Not Encephalization Quotient, Best Predicts
    Cognitive Ability across Non-Human Primates}},
758         journal = {Brain, Behavior and Evolution},
759         volume = {70},
760         pages = {115-124},
761         year = {2007}
762 % Absolute brain size measures were the best predictors of primate cognitive ability
    rather than encephalization quotient or brain size residuals, and there was no
    indication that neocortex-based measures were superior to measures based on the whole
    brain. Cognitive performance is entirely dependent on some absolute feature of the
    brain, like the combination of the total number of cortical neurons and the
    conduction velocity of their fibers.
763 }
764 @Article{Herculano-Houzel07,
765         author = {Herculano-Houzel et al.},
766         title = {{Cellular scaling rules for primate brains}},
767         journal = {PNAS},
768         volume = {104},
769         number = {9},
770         pages = {3562-3567},
771         year = {2007}
772 % The scaling function for primate brain is isometric (11*size=>10*neurons+12*non-
    neurons) and differ significantly from the rodent one, where brain size increases
    faster than the numbers of neurons. Primate brains have a larger number of neurons
    than rodent brains of similar size, presumably endowing them with greater
    computational power and cognitive abilities. In addition, the glia/neuron index does
    not correlate with brain mass in primates.
773 }
774 @Article{Ibraimov07,
775         author = {A. I. Ibraimov},
776         title = {{The Evolution of Body Heat Conductivity, Skin and Brain Size in
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Human}},
777         journal = {J. Hum. Ecol.},
778         volume = {21},
779         pages = {95-103},
780         year = {2007}
781 % During human evolution, the presence of skin covered with hair became a serious
    obstacle in keeping the temperature homeostasis, in particular to dissipate the
    excessive heat generated by an elarging brain. Human skin is covered by more than 1.5
    million sweat glands, which allow to evacuate most of the metabolic heat. The
    transfer of thermal energy for short distance, is restricted by characteristics of
    individual cells. The significant variability of the human Body Heat Conductivity is
    connected with the amount of chromosomal Q-Heterochromatin Regions in his genome. Q-
    HRs is available only in the genome of H. sapiens, P. troglodytes and G. gorilla. The
    heat-protection function of hair passed over to the layer of subcutaneous adipose
    tissue.
782 }
783 @Article{Herculano-Houzel08,
784         author = {Herculano-Houzel et al.},
785         title = {{The basic non-uniformity of the cerebral cortex}},
786         journal = {PNAS},
787         volume = {105},
788         number = {34},
789         pages = {12593-12598},
790         year = {2008}
791 % The relation Number/Area = Density*Thickness applies for the cerebral cortex.
    Across primate species, N/A is not constant, T is not inversely proportional to D, A
    increases more slowly than N, N/A is a linear function of D, and D is not related to
    A nor N.
792 }
793 @Article{Toro08,
794         author = {Toro et al.},
795         title = {{Brain size and folding of the human cerebral cortex}},
796         journal = {Cerebral Cortex},
797         volume = {18},
798         pages = {2352-2357},
799         year = {2008}
800 % Folding of the cerebral cortex may be a natural outcome of increasing brain size.
    In humans, the correlation between cortical surface and hemisheric volume has a slope
    of 0.85, higer than the geometrically expected 2/3, and varies along a rostro-caudal
    gradient. The expansion of the cerebral cortex, especially in the prefrontal regions,
    is a major evolutionary landmark in the emergence of human cognition.
801 }
802 @Article{Azevedo09,
803         author = {Azevedo et al.},
804         title = {{Equal numbers of neuronal and non-neuronal cells make the human
    brain an isometrically scaled-up primate brain}},
805         journal = {The Journal of Comparative Neurology},
806         volume = {513},
807         pages = {532-541},
808         year = {2009}
809 % The human brain is composed of 86.1 +/- 8.1 billion neurons and 84.6 +/- 9.8
    billion nonneuronal cells. Only 19% of all neurons are located in the cerebral
    cortex, so the greater cortical size (82% of total brain mass) in humans does not
    reflect an increased relative number of cortical neurons. These findings challenge
    the common view that humans stand out from other primates in their brain composition.
810 }
811 @Article{Herculano09,
812         author = {Herculano-Houzel et al.},
813         title = {{The human brain in numbers: a linearly scaled-up primate brain}},
814         journal = {Frontiers in Human Neuroscience},
815         volume = {3},
816         pages = {Article 31},
817         year = {2009}
818 % Brain size can no longer be considered a proxy for the number of neurons in the
    brain. The human brain is not exceptional in its cellular composition and cortex mass
    fraction. However, it has two advantages compared to other mammalian brains: being
    built on very economical space-saving scaling rules and being the largest brain among
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    primate brains. These findings argue in favor of a view of cognitive abilities that
    is centered on absolute numbers of neurons rather than body size or encephalization
    quotient.
819 }
820 @Article{Oberheim09,
821         author = {Oberheim et al.},
822         title = {{Uniquely hominid features of adult human astrocytes}},
823         journal = {The Journal of Neuroscience},
824         volume = {29},
825         pages = {3276-3287},
826         year = {2009}
827 % Human cortical astrocytes are both larger (2.6-fold in diameter and in lenght)
    structurally more complex (10-times more GFAP(glial fibrillary acidic protein)
    processes in parallel) and more diverse (several unique subclasses) than those of
    rodents. This astrocytic complexity may have permitted the increased functional
    competence of the adult human brain.
828 }
829 @Article{Allman10,
830         author = {Allman et al.},
831         title = {{The von Economo neurons in frontoinsular and anterior cingulate
    cortex in great apes and humans}},
832         journal = {Brain Struct. Funct.},
833         volume = {214},
834         pages = {495-517},
835         year = {2010}
836 % The von Economo neurons (VENs) are large bipolar neurons located in the
    frontoinsular cingulate cortex of the inferior anterior insula, whose activity is
    related to physiological changes in the body, decision-making, error recognition, and
    awareness. The protein encoded by the gene DISC1 suppresses dendritic branching, has
    undergone rapid evolutionary change in the human lineage and is preferentially
    expressed by the VENs, so it may be involved in the distinctive VEN morphology.
837 }
838 @Article{Herculano10A,
839         author = {Herculano-Houzel et al.},
840         title = {{Connectivity-driven white matter scaling and folding in primate
    cerebral cortex}},
841         journal = {PNAS},
842         volume = {107},
843         number = {44},
844         pages = {19008-19013},
845         year = {2010}
846 % The mass of the white matter scales linearly across species with its number of
    nonneuronal cells, which is proportional to the total length of myelinated axons in
    the white matter. This implies that the axonal cross-section area in the white matter
    A_w does not scale with the number of neurons in the gray matter Nr_g. The surface
    area of the white matter S_w scales as Nr_g^0.87 rather than Nr_g^1.0, so
    connectivity decreases in larger cerebral cortices because a diminishing fraction of
    neurons (scaling as Nr_g^−0.16) sends myelinated axons into the white matter. A white
    matter-based mechanism to account for increased cortical folding could be driven by
    connectivity-related tension in the white matter, pulling down on the gray matter.
847 }
848 @Article{Herculano10B,
849         author = {Herculano-Houzel et al.},
850         title = {{Coordinated scaling of cortical and cerebellar numbers of neurons}},
851         journal = {Frontiers in Neuroanatomy},
852         volume = {4},
853         pages = {Article 12},
854         year = {2010}
855 % The relative size of the cortex increases with brain size, but not the relative
    cerebellar size. However, the numbers of neurons in the cortex and cerebellum are
    directly correlated across mammalian species of four different orders, with on
    average 3.6 cerebellar neurons to every cortical neuron.
856 }
857 @Article{Sherry10,
858         author = {Sherry et al.},
859         title = {{Seasonal hippocampal plasticity in food-storing birds}},
860         journal = {Phil. Trans. R. Soc. B},
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861         volume = {365},
862         pages = {933-943},
863         year = {2010}
864 % The total size of the chickadee hippocampus (necessary for accurate cache
    retrieval) increases in autumn and winter as does the rate of hippocampal
    neurogenesis. The peak in recruitment of new neurons into the hippocampus occurs
    before birds have completed food storing, qso may therefore be associated with
    encoding the spatial locations of caches or creating a neuronal architecture involved
    in the recollection of cache sites.
865 }
866 @Article{Weisbecker10,
867         author = {Weisbeckeret al.},
868         title = {{Brain size life history and metabolism at the marsupial placental
    dichotomy}},
869         journal = {PNAS},
870         volume = {107},
871         pages = {16216-16221},
872         year = {2010}
873 % In placentals, basal metabolic rate (BMR) correlate with relative brain size.
    Marsupials lack this correlation because they achieve brain sizes comparable to
    placentals through extended lactation. Brain development (including most of
    neurogenesis) continues to proceed slowly during the extended postnatal life in the
    pouch. Also, the misconception that marsupials are systematically smaller-brained
    than placentals is driven by the inclusion of primates in the calculations.
874 }
875 @Article{Herculano11A,
876         author = {Herculano-Houzel},
877         title = {{Not All Brains Are Made the Same: New Views on Brain Scaling in
    Evolution}},
878         journal = {Brain, Behavior and Evolution},
879         volume = {78},
880         pages = {22-36},
881         year = {2011}
882 % The cortex and cerebellum scale in size as clade-specific functions of their
    numbers of neurons, so the neuronal density and glia/neuron ratio do not scale
    universally with structure mass and mammalian brains of a similar size can hold very
    different numbers of neurons. Different species and brain structures gain nonneuronal
    cells in the same manner, average neuronal size scales in a structure- and clade-
    specific manner, glia/neuron ratio scales homogeneously with neuronal density and
    average neuronal size.
883 }
884 @Article{Herculano11A,
885         author = {Herculano-Houzel},
886         title = {{Scaling of Brain Metabolism with a Fixed Energy Budget per Neuron:
    Implications for Neuronal Activity, Plasticity and Evolution}},
887         journal = {PLOS One},
888         volume = {6},
889         number = {3},
890         pages = {e17514},
891         year = {2011}
892 % The estimated glucose use per neuron only vary by 40% across six species of rodents
    and primates and does not correlate with the neuronal density, number of neurons or
    brain size. It has a average value of 1.50+/-0.49*10-8 µmol/neuron-min in the cortex
    and 0.87+/-0.36*10-9 µmol/neuron-min in the cerebellum, which leads to a metabolic
    cost of 6.0 kCal/day/10+9 neurons given a cortex/cerebellum repartition of 0.80. The
    average oxygen consumption is 6.63+/-1.37 ml/neuron-min.
893 }
894 @Article{Daegling12,
895         author = {David J. Daegling},
896         title = {{The Human Mandible and the Origins of Speech}},
897         journal = {Journal of Anthropology},
898         volume = {2012},
899         pages = {Article ID 201502},
900         year = {2012}
901 % High-frequency, low-magnitude loads associated with articulate speech are
    hypothesized to explain the apparent paradox of hypertrophied mandibular bone in
    contrast to the reduced bone thickness that typifies the remainder of the modern
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human skull. This hypothesis is testable by different means, but at present it is not directly supported by experimental, developmental or comparative data. Instead, the observations on bone mass in human mandibles are merely consistent with the idea that the mechanobiology of speech can effect bone formation to a significant degree.
}
@Article{Dugas-Ford12,
        author = {Dugas-Ford et al.},
        title = {{Cell-type homologies and the origins of the neocortex}},
        journal = {PNAS},
        volume = {109},
        pages = {16974-16979},
        year = {2012}
% The six-layered neocortex is a uniquely mammalian structure with disputed evolutionary origins. Findings establish that the layer 4 input and the layer 5 output cell types are conserved across the amniotes, but are organized into very different architectures: nuclei in birds, cortical areas in reptiles and cortical layers in mammals.
}
@Article{Fonseca12,
        author = {Fonseca-Azevedo et al.},
        title = {{Metabolic constraint imposes tradeoff between body size and number of brain neurons in human evolution}},
        journal = {PNAS},
        volume = {109},
        number = {45},
        pages = {18571-18576},
        year = {2012}
% The energetic cost of the brain is a linear function of its numbers of neurons. Given the limited number of hours available for feeding and the low caloric yield of raw foods, a tradeoff appears between body size and number of brain neurons. This limitation was probably overcome in Homo erectus with the shift to a cooked diet.
}
@Article{Han12,
        author = {Han et al.},
        title = {{Forebrain Engraftment by Human Glial Progenitor Cells Enhances Synaptic Plasticity and Learning in Adult Mice}},
        journal = {Cell Stem Cell},
        volume = {12},
        pages = {342-353},
        year = {2013}
% Engrafted human glial progenitor cells (GPCs) into neonatal immunodeficient mice resulted in large numbers of human glial astrocytes. They retain the size and pleomorphism of hominid astroglia, propagate Ca2+ signals 3-fold faster than their hosts, and release the human glial cytokine TNFalpha that potentiates synaptic transmission via an increase in GluR1 receptors. Chimeric mice exhibited enhanced learning abilities in Barnes maze navigation and object-location memory, but also both contextual and tone fear conditioning.
}
@Article{Herculano12,
        author = {Herculano-Houzel},
        title = {{The remarkable yet not extraordinary human brain as a scaled-up primate brain and its associated cost}},
        journal = {PNAS},
        volume = {109},
        number = {suppl. 1},
        pages = {10661-10668},
        year = {2012},
% The human brain is a scaled-up primate brain in its cellular composition and metabolic cost, with a relatively enlarged cerebral cortex that does not have a relatively larger number of brain neurons yet is remarkable in its cognitive abilities and metabolism simply because of its extremely large number of neurons.
}
@Article{Lee12,
        author = {Lee et al.},
        title = {{Reciprocal influence of masticatory apparatus, craniofacial structure and whole body homeostasis}},
        journal = {Medical Hypotheses},
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945         volume = {79},
946         pages = {761-766},
947         year = {2012}
948 % There have been disputes on the impact of MYH16 gene mutation on the evolution into human, because (1) the age of the deletion at 5.3 Mya is inconsistent with a simple model of pseudogene evolution for human MYH16 (2) greater encephalization in humans is attained mostly by acceleration of brain growth rates in fetal and early postnatal stages, during early ontogeny, long before the masticatory muscles have reached peak force-generating potential.
949 }
950 @Article{Mota12,
951         author = {Mota et al.},
952         title = {{How the cortex gets its folds An inside-out, connectivity-driven model for the scaling of mammalian cortical folding}},
953         journal = {Frontiers in Neuroanatomy},
954         volume = {6},
955         pages = {Article 3},
956         year = {2012}
957 % A testable, quantitative model of cortical folding is presented, driven by tension along the length of axons in the WM that considers that axonal connections through the WM generate tension that leads to inward folding of the WM surface then of the GM surface. An important simplifying hypothesis assumes that axons leaving or entering the WM do so approximately perpendicularly to the WM–GM interface. The model predicts that for a same tension, folding increases with connectivity through the WM and increased axonal cross-section; for a same number of neurons, higher connectivity through the WM leads to a higher degree of folding as well as an on average thinner GM across species.
958 % It is often considered that cortical folding is a means of making more neurons fit into a space-limited brain, as the larger-than-expected cortical surface supposedly allows a larger-than-expected number of neurons for a given cranial volume. However, the model shows that cortical expansion can no longer be considered to occur homogeneously nor with a constant number of neurons beneath a unit surface area. This means that it is no longer necessarily true that more convoluted cortices have more neurons than less convoluted cortices.
959 }
960 @Article{Smaers12,
961         author = {Smaers et al.},
962         title = {{Comparative analyses of evolutionary rates reveal different pathways to encephalization in bats, carnivorans, and primates}},
963         journal = {PNAS},
964         volume = {109},
965         pages = {18006-18011},
966         year = {2012}
967 %  A principal focus on interpreting relative brain size evolution as selection on neuronal capacity confounds the effects of body mass changes, thereby hiding important aspects that may contribute to explaining animal diversity. The majority of branches indicate a decelerated rate of brain mass change compared with body mass, suggesting that body mass significantly outpaced brain mass changes in most lineages.
968 % For bats, a decrease in body mass can lead to a decrease in physiological costs of powered flight and results in increased maneuverability, allowing bats to forage in cluttered space. However, navigation and orientation in cluttered environments are neurologically more demanding, preventing bats from equally high rates of brain mass reduction during dwarfing.
969 }
970 @Article{Watson12,
971         author = {Watson et al.},
972         title = {{What Determines Motor Neuron Number Slow Scaling of Facial Motor Neuron Numbers With Body Mass in Marsupials and Primates}},
973         journal = {The Anatomical Record},
974         volume = {295},
975         pages = {1683-1691},
976         year = {2012}
977 % In 22 marsupial species, the number of facial motor neurons is strongly correlated with body mass and scales as N=M^0.184 : doubling the body mass increase the number of facial motor neurons by only 14%. This very small exposant is close to the value of 0.346 for primates and similar to the values for birds and amphibians. Further comparative studies relating the size of particular motor neuron pools, such as those
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that innervate the hands, and manual dexterity are required to address this issue.
}
@Article{Gervain13,
        author = {Gervain et al.},
        title = {{Valproate reopens critical-period learning of absolute pitch}},
        journal = {Frontiers in Systems Neuroscience},
        volume = {7},
        pages = {Article 102},
        year = {2013}
% Histone-deacetylase inhibitors (HDAC) like Valproate enable adults to establish perceptual preferences that are otherwise impossible to acquire after youth, by facilitating critical-period learning in the adult brain without a general change in cognitive function. VPA is commonly used as a mood stabilizer in bipolar disorder and has an effect on the Altman Self-Rating Mania Scale, but an improved or more stable mood cannot explain the obtained results.
}
@Article{Kamberov13,
        author = {Kamberov et al.},
        title = {{Modeling Recent Human Evolution in Mice by Expression of a Selected EDAR Variant}},
        journal = {Cell},
        volume = {152},
        pages = {691-702},
        year = {2013}
% The EDARV370A variant of the human Ectodysplasin receptor arose in central China ~30kya and appears to have been subject of recent positive selection in humans. In knock-in mouse models, this allele results in increased hair thickness, increased eccrine gland number, reduced mammary fat pad size, and increased mammary gland branch density.
}
@Article{Paabo13,
        author = {Svante Pääbo},
        title = {{Human origins from a genomic perspective}},
        journal = {Scripta Varia},
        volume = {121},
        url = {www.casinapioiv.va/content/dam/accademia/pdf/sv121/sv121-paabo.pdf},
        year = {2013}
% The list of genetic changes which define modern humans as a group distinct from other primates (shared in identical form among almost all humans, but not by Neandertals and Denisovans) is not extremely long : 111,812 single nucleotide changes and 9,499 insertions or deletions of a number of adjacent nucleotides, compared to 3 billion nucleotides of the entire genome.
}
@Article{Ribeiro13,
        author = {Ribeiro et al.},
        title = {{The human cerebral cortex is neither one nor many: neuronal distribution reveals two quantitatively different zones in the gray matter, three in the white matter, and explains local variations in cortical folding}},
        journal = {Frontiers in Neuroanatomy},
        volume = {7},
        pages = {Article 28},
        year = {2013}
% The human prefrontal cortex shares the same relationship between cortical volume and number of neurons with the remainder of the cortex, but has the largest fraction of neuronal connectivity through the white matter and the smallest average axonal caliber in the white matter. Local variations in cortical folding are neither a function of local numbers of neurons nor of cortical thickness, but are best explained by the folding of the white matter surface.
% The human cerebral cortex is divided in two zones (occipital and non-occipital) that differ in how neurons are distributed across their gray matter volume and in three zones (prefrontal, occipital, and non-occipital) that differ in how neurons are connected through the white matter.
}
@Article{Rohner13,
        author = {Rohner et al.},
        title = {{Cryptic Variation in Morphological Evolution: HSP90 as a Capacitor for Loss of Eyes in Cavefish}},
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1019          journal = {Science},
1020          volume = {342},
1021          pages = {1372-1375},
1022          year = {2013}
1023    % HSP90 (heat shock protein 90) provides a molecular mechanism for buffering genetic
      variation and releasing it in response to environmental, by assisting in the folding
      of proteins that are metastable signal transducers, such as kinases, transcription
      factors, and ubiquitin ligases. Inhibiting HSP90 with Radicicol results in the
      release of cryptic variation present in the untreated population. Most of the low-
      penetrance phenotypes were not obviously adaptive and either not viable or transient,
      but the viables alleles remain active in the offsping even without HSP inhibitors.
1024    }
1025    @Article{Snell-Rood13,
1026          author = {Snell-Rood et al.},
1027          title = {{Anthropogenic environments exert variable selection on cranial
      capacity in mammals}},
1028          journal = {Proc. R. Soc. B},
1029          volume = {280},
1030          pages = {20131384},
1031          year = {2013}
1032    % It is thought that behaviourally flexible species will be able to cope with novel
      and rapidly changing environments associated with human activity. Results provide
      partial support for this hypothesis, although selection may be most pronounced early
      during the urban colonization process : urban populations of two small mammal species
      had significantly greater cranial capacity than rural populations and species with
      higher fecundity showed more pronounced differentiation between urban and rural
      populations. However, data also suggest that behavioural plasticity may be
      simultaneously favoured in rural environments, which are also changing because of
      human activity.
1033    }
1034    @Article{Ventura13,
1035          author = {Ventura-Antunes et al.},
1036          title = {{Different scaling of white matter volume, cortical connectivity,
      and gyrification across rodent and primate brains}},
1037          journal = {Frontiers in Neuroanatomy},
1038          volume = {7},
1039          pages = {Article 3},
1040          year = {2013}
1041    % Very different scaling rules for white matter expansion are found between rodents
      and primates, favoring volume conservation and smaller propagation times in the
      latter. Order-specific scaling of the white matter can be attributed to a different
      scaling of average fiber caliber and neuronal connectivity. The cortical folding
      increase as function of the number of cortical neurons is faster in primates than in
      rodents.
1042    }
1043    % ============================
1044    % Dossier "Neuro-génétique"     (26 articles)
1045
1046    @Article{Chenn02,
1047          author = {Chenn et al.},
1048          title = {{Regulation of Cerebral Cortical Size by Control of Cell Cycle Exit
      in Neural Precursors}},
1049          journal = {Science},
1050          volume = {297},
1051          pages = {365-369},
1052          year = {2002}
1053    % Transgenic mice expressing a stabilized β-catenin in neural precursors develop
      enlarged brains with increased cerebral cortical surface area and folds resembling
      sulci and gyri of higher mammals. β-catenin can function in the decision of
      neuroepithelial precursor cells to proliferate or differentiate during neuronal
      development and can regulate cerebral cortical size by controlling the generation of
      neural precursor cells.
1054    }
1055    @Article{Enard02,
1056          author = {Enard et al.},
1057          title = {{Molecular evolution of FOXP2, a gene involved in speech and
      language}},
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1058          journal = {Nature},
1059          volume = {418},
1060          pages = {869-872},
1061          year = {2002}
1062    % FOXP2 is the first gene relevant to the human ability to develop language, two
        functional copies seeming to be required for acquisition of normal spoken language.
        Individuals with disruption of FOXP2 have multiple difficulties with both expressive
        and receptive aspects of language and grammar, a predominant feature being an
        impairment of selection and sequencing of fine orofacial movements. Also, human FOXP2
        contains two changes in amino-acid coding and a pattern of nucleotide polymorphism
        strongly suggesting selection during recent human evolution.
1063    }
1064    @Article{Chenn03,
1065          author = {Chenn et al.},
1066          title = {{Increased Neuronal Production, Enlarged Forebrains and
        Cytoarchitectural Distortions in β-Catenin Overexpressing Transgenic Mice}},
1067          journal = {Cerebral Cortex},
1068          volume = {13},
1069          pages = {599-606},
1070          year = {2003}
1071    % Compared to the previous study, adult mice expressing lower levels of stabilized β-
        catenin still develop enlarged forebrains with thin cerebral cortices with increased
        surface area, expanded subventricular zones with subcortical aggregations of neurons
        and  enlarged, distorted hippocampi. However, their brains also show apparent arrest
        of neuronal migration and dramatic disorganization of the layering of the cerebral
        cortex. Transgenic mice occasionally survived to adulthood, with abnormal aggregates
        of neurons in the cortex, hippocampus, amygdala, along with an increase in fearful
        and agressive behaviour.
1072    }
1073    @Article{Zhang03,
1074          author = {Jianzhi Zhang},
1075          title = {{Evolution of the human ASPM gene, a major determinant of brain
        size}},
1076          journal = {Genetics},
1077          volume = {165},
1078          pages = {2063–2070},
1079          year = {2003}
1080    % ASPM went through an episode of accelerated sequence evolution by positive
        Darwinian selection after the split of humans and chimpanzees but before the
        separation of modern non-Africans from Africans, between 6-7 and 0.1 MYa, while the
        human brain expansion took place between 2-2.5 and 0.2-0.4 MYa. The adaptive amino
        acid substitutions in human ASPM are located in exons 3-18-20-21-22, which encode a
        putative microtubule-binding domain and an IQ calmodulin-binding domain, suggesting a
        role in the regulation of mitosis in the nervous system.
1081    }
1082    @Article{Dorus04,
1083          author = {Dorus et al.},
1084          title = {{Accelerated evolution of nervous system genes in the origin of Homo
        sapiens}},
1085          journal = {Cell},
1086          volume = {119},
1087          pages = {1027-1040},
1088          year = {2004}
1089    % The pace of protein evolution as scaled to neutral divergence is commonly
        approximated by the ratio between nonsynonymous (Ka) and synonymous (Ks) substitution
        rates. Nervous system genes have overall low Ka/Ks, since they tend to experience
        strong evolutionary constraint, but housekeeping genes Ka/Ks were lower. Among them,
        24 primate genes have significantly higher Ka/Ks than in rodents and show the
        following effects on knockout :
1090    % CASP3 (exhibits severe overgrowth of brain) LHX1 (absence of brain and other
        anterior structures) NRCAM (reduced cerebellum size) ASPM, MCPH1, PAFAH1B1, SHH
        (microcephaly) DVL1 (defective social behavior) PEG3 (impaired maternal behavior)
        ADCYAP1 (altered anxiety state) GDI1, GRIN2A, CSPG3 (deficits in learning or neural
        correlates of learning) CHRM5, DRD2, OPRM1 (defects in acquiring reward-mediated
        behavior) AANAT (alteration in circadian rhythm)
1091    % Other genes not included in this study, such as AHI1 and GLUD2, have also revealed
        a possible link between alterations in protein sequences and phenotypic evolution of
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      the human brain (Ferland et al. 2004; Burki and Kaessmann 2004).
1092  }
1093  @Article{Rakic04,
1094          author = {Pasko Rakic},
1095          title = {{Genetic Control of Cortical Convolutions}},
1096          journal = {Science},
1097          volume = {303},
1098          pages = {1983-1984},
1099          year = {2004}
1100  % The human GPR56 gene encodes for an orphan G protein–coupled receptor, implicating
      receptor signaling in the development of specific areas of the human cerebral cortex.
      The mouse Gpr56 gene preferentially affects neuronal progenitors in the embryonic
      mouse proliferative zones. An experimentally induced increase in neuronal production
      in the ventricular zone resulted in a larger number of radial columns and an increase
      in the cortical surface. Overproduction of neurons due to GPR56 mutations probably
      affects neurons that use a radial rather than a tangential mode of migration.
1101  }
1102  @Article{Webb05,
1103          author = {Webb et al.},
1104          title = {{FoxP2 in Song-Learning Birds and Vocal-Learning Mammals}},
1105          journal = {Journal of Heredity},
1106          volume = {96},
1107          pages = {212-216},
1108          year = {2005}
1109  % FoxP2 sequences are extremely conservated  in birds, with unusually low rates of
      synonymous substitutions, but no amino acid substitutions are shared between song-
      learning birds and humans. Furthermore, sequences from vocal-learning whales,
      dolphins, and bats do not share the human-unique substitutions.
1110  }
1111  @Article{Lien06,
1112          author = {Lien et al.},
1113          title = {{Alpha-e-catenin controls cerebral cortical size by regulating the
      hedgehog signaling pathway}},
1114          journal = {Science},
1115          volume = {311},
1116          pages = {1609-1612},
1117          year = {2006}
1118  % Central nervous system–specific deletion of the essential adherens junction gene,
      aE-catenin, causes abnormal activation of the hedgehog pathway, resulting in
      shortening of the cell cycle, decreased apoptosis, and cortical hyperplasia. This
      connection may provide a negative feedback loop controlling the size of developing
      cerebral cortex. Solid tumors may escape 'crowd control' of cell proliferation by
      destabilizing the adherens junctions, one of the frequent events reported in human
      cancers.
1119  }
1120  @Article{Niehrs06,
1121          author = {C. Niehrs},
1122          title = {{Function and biological roles of the Dickkopf family of Wnt
      modulators}},
1123          journal = {Oncogene},
1124          volume = {25},
1125          pages = {7469-7481},
1126          year = {2006}
1127  % Dkks play an important role in vertebrate development, where they locally inhibit
      Wnt regulated processes such as antero–posterior axial patterning, limb development,
      somitogenesis and eye formation. In the adult, Dkks are implicated in bone formation
      and bone disease, cancer and Alzheimer’s disease. They encode secreted proteins that
      typically antagonize Wnt/b-catenin signaling, by inhibiting the Wnt coreceptors Lrp5
      and 6.
1128  }
1129  @Article{Mangale08,
1130          author = {Mangale et al.},
1131          title = {{Lhx2 Selector Activity Specifies Cortical Identity and Suppresses
      Hippocampal Organizer Fate}},
1132          journal = {Science},
1133          volume = {319},
1134          pages = {304-309},
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1135          year = {2008}
1136  % Lhx2 acts as a classic selector gene and essential intrinsic determinant of
      cortical identity, suppressing two alternative fates (hem and antihem) in cortical
      precursors at the edges of cortex. Lhx2 null embryos possess excessive hem and
      choroid plexus epithelium at the expense of hippocampus and neocortex. Within the Bmp-
      Fgf8-Wnt signaling frameworkat the telencephalic midline, Lhx2 plays a dual role in
      suppressing hem fate while specifying the fate of hem-responsive tissue to allow for
      hippocampal specification within the Lhx2-positive cortical field.
1137  }
1138  @Article{Phillips08,
1139          author = {Patrick C. Phillips},
1140          title = {{Epistasis-the essential role of gene interactions in the structure
      and evolution of genetic systems}},
1141          journal = {Nat. Rev. Genet.},
1142          volume = {9},
1143          pages = {855-867},
1144          year = {2008}
1145  %
1146  }
1147  @Article{Prabhakar08,
1148          author = {Prabhakar et al.},
1149          pages = {1346-1350},
1150          title = {{Human-Specific Gain of Function in a Developmental Enhancer}},
1151          journal = {Science},
1152          volume = {321},
1153          year = {2008}
1154  % The conserved noncoding sequence HACNS1 actes as an enhancer of gene expression
      with a strong limb expression domain and a consistent gain of function including the
      presumptive anterior wrist and proximal thumb. 13 substitutions clustered in an 81–
      base pair highly constrained module are sufficient to confer the human-specific limb
      expression domain.
1155  }
1156  @Article{Valender08,
1157          author = {Valender et al.},
1158          title = {{Genetic basis of human brain evolution}},
1159          journal = {Trends in Neurosciences},
1160          volume = {31},
1161          pages = {637-644},
1162          year = {2008}
1163  % Review and lists numerous genetic genetic changes that potentially underlie human
      brain evolution. They span a wide range from single-nucleotide substitutions to large-
      scale structural alterations of the genome. Their functional consequences vary from
      protein-sequence alterations to cis-regulatory variations and even the emergence of
      new genes and the extinction of existing ones.
1164  }
1165  @Article{Enard09,
1166          author = {Enard et al.},
1167          title = {{A humanized version of foxp2 affects cortico-basal ganglia circuits
      in mice}},
1168          journal = {Cell},
1169          volume = {137},
1170          pages = {961-971},
1171          year = {2009}
1172  % Mice with a humanized version of foxp2 have qualitatively different ultrasonic
      vocalizations, decreased exploratory behavior and decreased dopamine concentrations
      suggesting that the human allele affects basal ganglia. Also, medium spiny neurons in
      the striatum have increased dendrite lengths and increased synaptic plasticity.
      Alterations in cortico-basal ganglia circuits might have been important for the
      evolution of speech and language in humans.
1173  }
1174  @Article{Fisher09,
1175          author = {Fisher et al.},
1176          title = {{FOXP2 as a molecular window into speech and language}},
1177          journal = {Trends in Genetics},
1178          volume = {25},
1179          pages = {161-177},
1180          year = {2009}
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% Reduced FoxP2 dosage yields abnormal synaptic plasticity and impaired motor-skill learning in mice, and disrupts vocal learning in songbirds. Converging data indicate that Foxp2 is important for modulating the plasticity of relevant neural circuits.
}
@Article{Kenyon10,
        author = {Cynthia J. Kenyon},
        title = {{The genetics of ageing}},
        journal = {Nature},
        volume = {464},
        pages = {504-512},
        year = {2010}
%
}
@Article{Barak11,
        author = {Barak et al.},
        pages = {590-594},
        title = {{Recessive LAMC3 mutations cause malformations of occipital cortical development}},
        journal = {Nature Genetics},
        volume = {43},
        year = {2011}
}
@Article{McLean11,
        author = {Mclean et al.},
        pages = {216-219},
        title = {{Human-specific loss of regulatory DNA and the evolution of human-specific traits}},
        journal = {Nature},
        volume = {471},
        year = {2011}
}
@Article{Scharff11,
        author = {Scharff et al.},
        pages = {2124-2140},
        title = {{Evo-devo, deep homology and FoxP2: implications for the evolution of speech and language}},
        journal = {Phil. Trans. R. Soc. B},
        volume = {366},
        year = {2011}
}
@Article{Albert12,
        author = {Albert et al.},
        title = {{A Comparison of Brain Gene Expression Levels in Domesticated and Wild Animals}},
        journal = {PLoS Genetics},
        volume = {8},
        pages = {e1002962},
        year = {2012}
% }
}
@Article{Charrier12,
        author = {Charrier et al.},
        pages = {923-935},
        title = {{Inhibition of SRGAP2 Function by Its Human-Specific Paralogs Induces Neoteny during Spine Maturation}},
        journal = {Cell},
        volume = {149},
        year = {2012}
}
@Article{Dennis12,
        author = {Dennis et al.},
        pages = {912-922},
        title = {{Evolution of Human-Specific Neural SRGAP2 Genes by Incomplete Segmental Duplication}},
        journal = {Cell},
        volume = {149},
        year = {2012}
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}
@Article{Hu12,
        author = {Hu et al.},
        pages = {1145},
        title = {{Evolution of the human-specific microRNA miR-941}},
        journal = {Nature Communications},
        volume = {3},
        year = {2012}
}
@Article{Konopka12,
        author = {Konopka et al.},
        pages = {601-617},
        title = {{Human-Specific Transcriptional Networks in the Brain}},
        journal = {Neuron},
        volume = {75},
        year = {2012}
}
@Article{Maricic12,
        author = {Maricic et al.},
        title = {{A Recent Evolutionary Change Affects a Regulatory Element in the Human FOXP2 Gene}},
        journal = {Mol. Biol. Evol.},
        volume = {30},
        pages = {844-852},
        year = {2012}
% }
}
@Article{Seib13,
        author = {Seib et al.},
        title = {{Loss of Dickkopf-1 Restores Neurogenesis in Old Age and Counteracts Cognitive Decline}},
        journal = {Cell Stem Cell},
        volume = {12},
        pages = {204-214},
        year = {2013}
% }
}

% ============================
% Dossier "Neuro divers"

% ============================
% Autres publications

% ============================
% Livres et articles grand-public
@Book{Sirius,
        title = {{Sirius: A Fantasy of Love and Discord}},
        publisher = {Secker & Warburg},
        author = {Olaf Stapledon},
        year = {1944},
}
@Book{Moreau,
        title = {{The Island of Doctor Moreau}},
        publisher = { Heinemann},
        author = {H. G. Wells},
        year = {1896}
}
@Book{Uplift,
        title = {{Uplift: The Complete Original Trilogy}},
        publisher = {Orbit},
        author = {David Brin},
        year = {1980-1987},
}
@Book{Humpur,
        title = {{Les fables de l'Humpur}},
        publisher = {Millenaires / J'ai Lu},
```

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1305          author = {Pierre Bordage},
1306          year = {1999},
1307  }
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