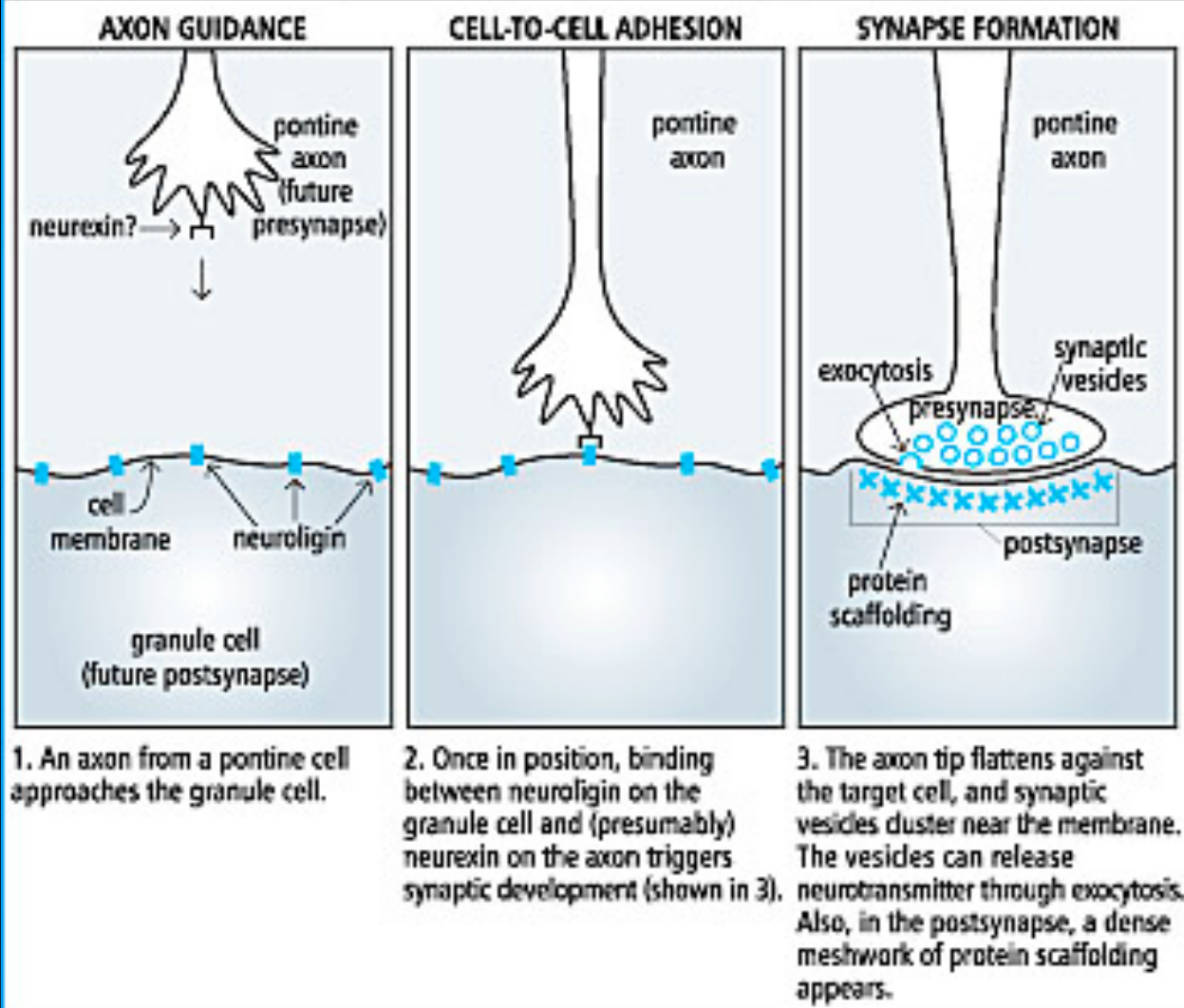
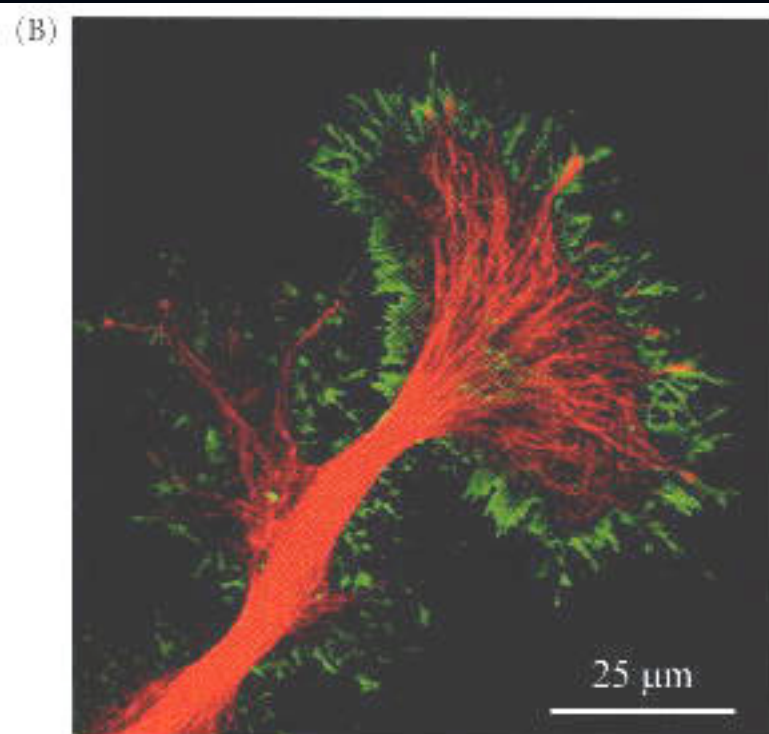
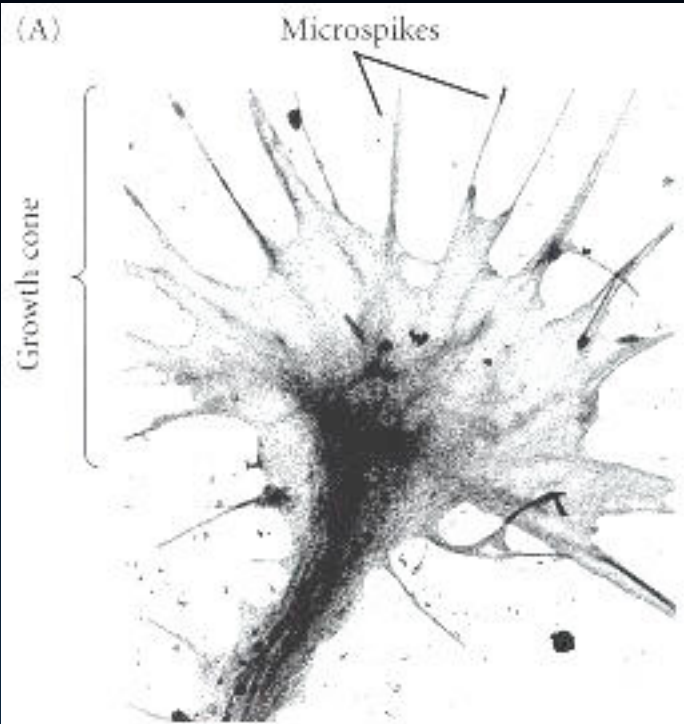


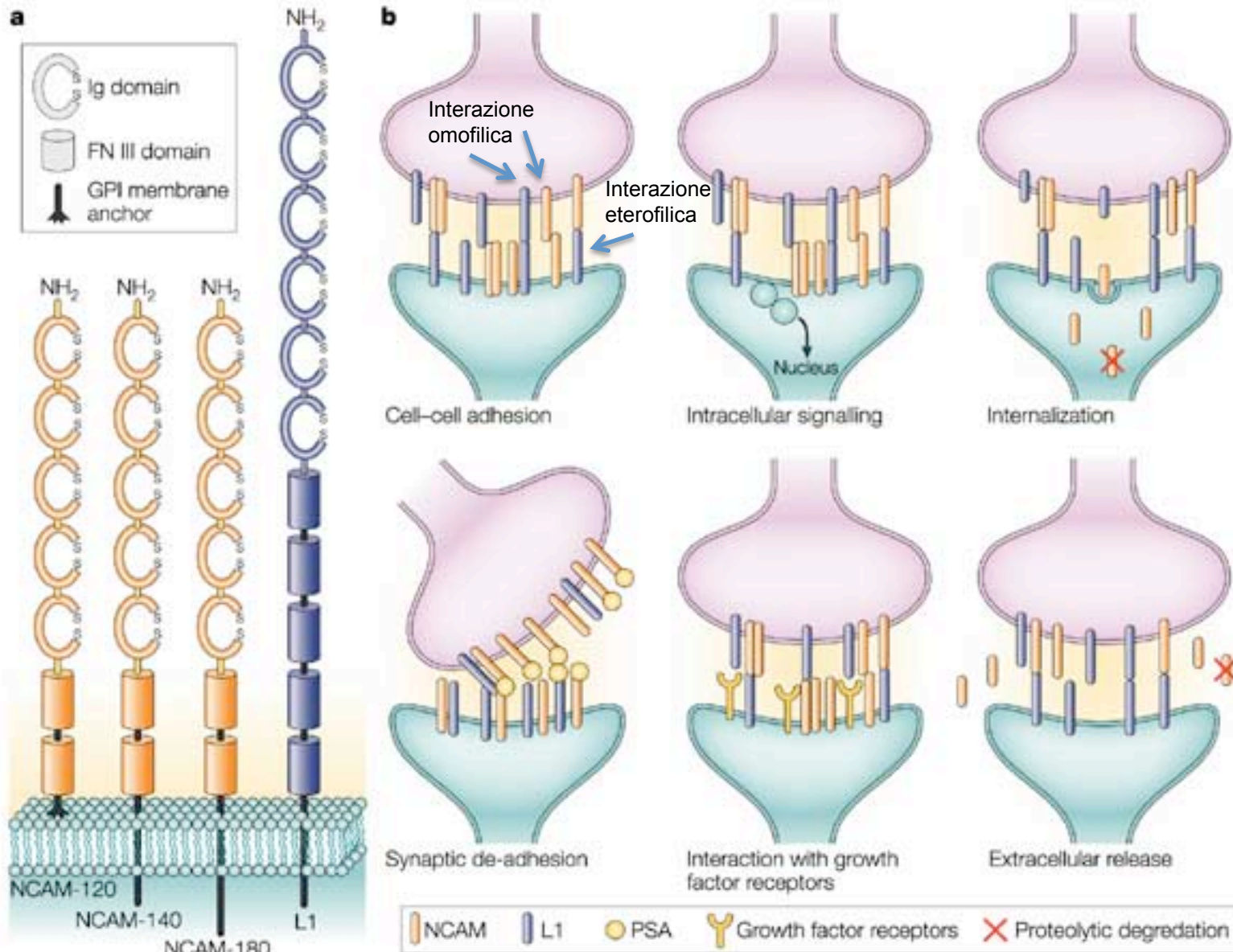
A MODEL FOR SYNAPTOGENESIS



1. Input da morfogeni
2. Proliferaazione (in più fasi)
3. Migrazione
4. Crescita, protezione e guida assonale
5. Selezione
6. Sinaptogenesi



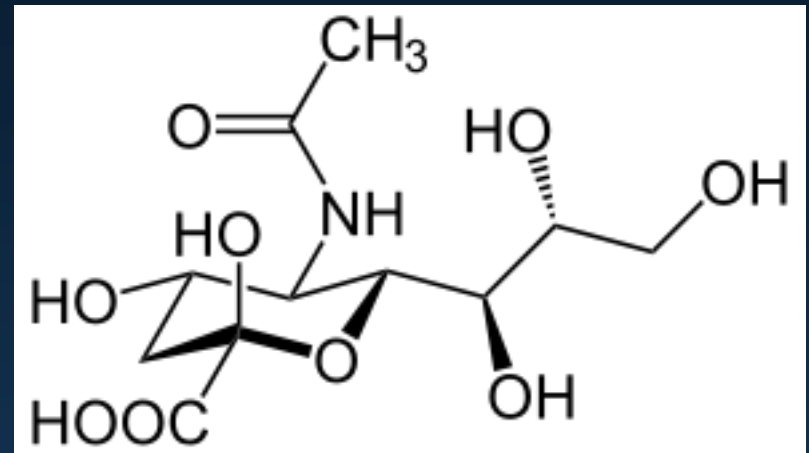
NCAM



NCAM NCAM is expressed as three main isoforms — NCAM-120, NCAM-140 and NCAM-180 (the numbers refer to their relative molecular weights) — which are generated by alternative splicing of pre-mRNA that is encoded by a single NCAM gene. Extracellularly, all isoforms bear five **Ig-like modules** and two **fibronectin type III modules** (see panel a). NCAM-120 is anchored to the cell membrane through a **glycosylphosphatidylinositol** (GPI) membrane anchor, whereas NCAM-140 and NCAM-180 are transmembrane proteins that have cytoplasmic domains of different lengths. NCAM-140 promotes neurite outgrowth in migrating growth cones with more potency than does NCAM-180 (Ref. [141](#)).

L1 L1 is a transmembrane glycoprotein that contains six Ig-like and five fibronectin type III-like extracellular modules. It is found at regions of contact between neighbouring axons and on growth cones, where it modulates many cellular functions. Spontaneous mutations in L1 produce various neurological syndromes, including mental retardation.

PSA–NCAM Polysialylation is an important post-translational modification of NCAM, and it involves the addition of extended chains of the carbohydrate 2,8-linked polysialic acid (PSA). PSA modulates cell interactions through its attachment to NCAM, which interferes with NCAM's binding properties. It is highly expressed during brain development, but in the adult nervous system it is restricted to regions that are characterized by ongoing neuronal and synaptic plasticity, such as the olfactory bulb, the dentate gyrus and the hypothalamus. PSA–NCAM is synthesized by two polysialyltransferases, ST8SIAII/STX and ST8SIAIV/PST. STX is the principal enzyme that is expressed in the embryo, whereas PST is more prominent in the postnatal brain.



Olivia Wilde

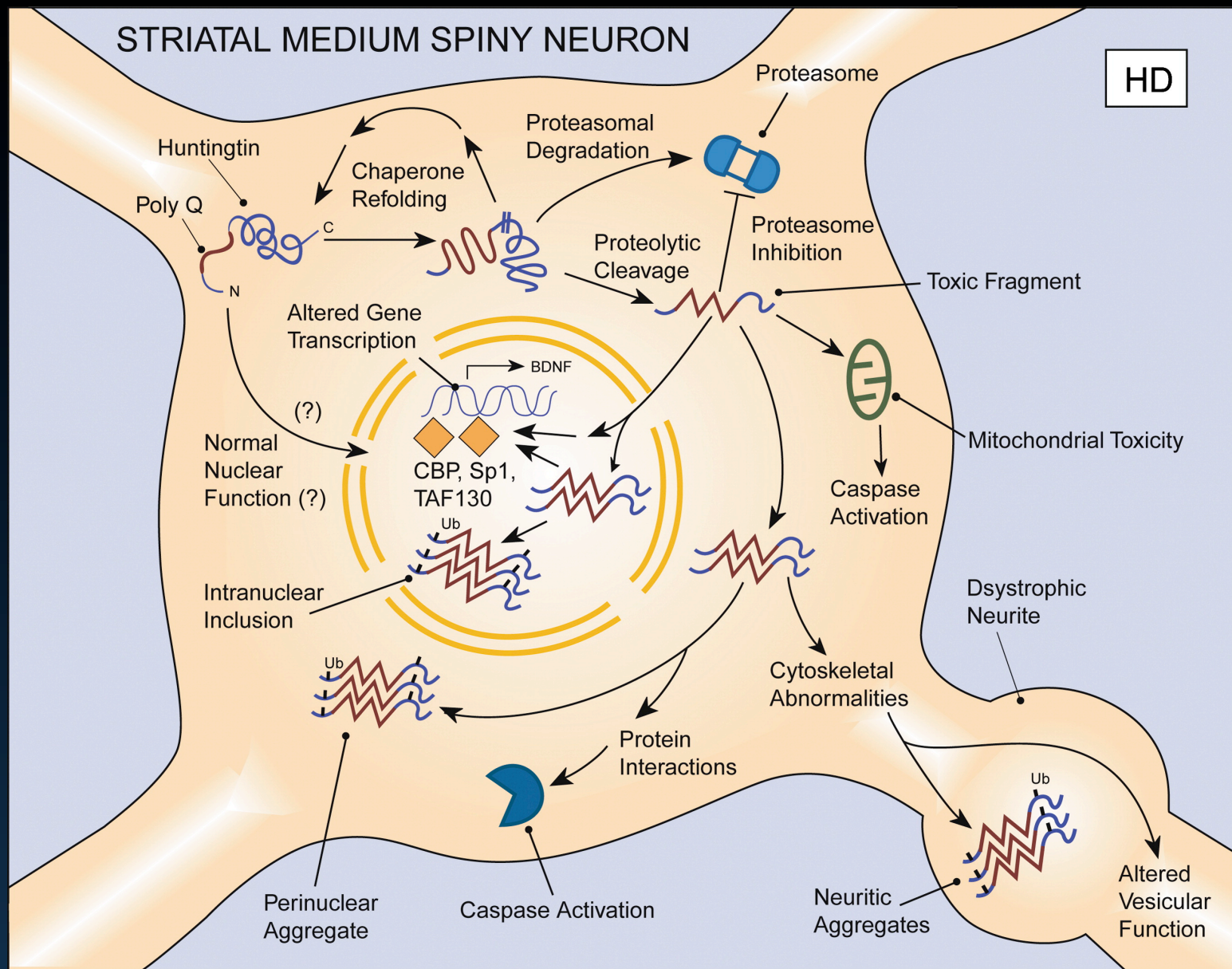


Huntington Disease

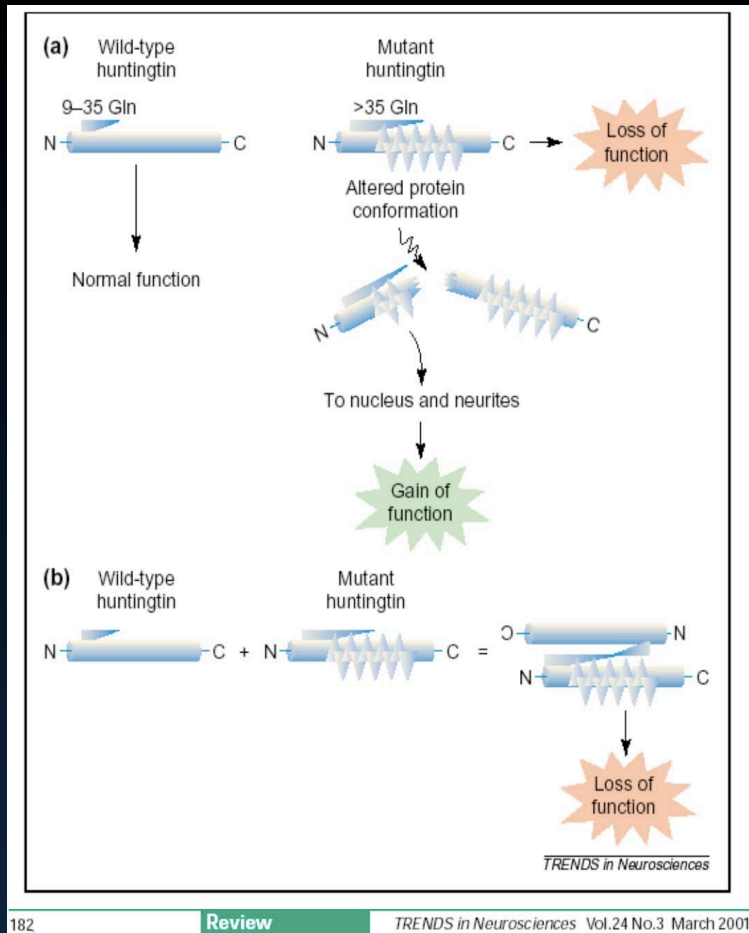
- HD gene, 'huntington', short arm of chromosome #4
 - Protein produced by the gene has no homology with other genes
 - Accumulates inside neuronal nuclei (forming inclusions) and inside nerve cell processes
 - Autosomal dominant
- ❖ Fatal, progressive degeneration and atrophy of the striatum (caudate nucleus and putamen) and frontal cortex with neuronal depletion and gliosis
 - Especially cholinergic and GABA-ergic neurons
 - GABA – CNS neurotransmitter; aa; inhibitory nerve impulses
- Clinical
 - Delay of clinical abnormalities until age 30-40
 - Age of onset is related to length of the HD gene's nucleotide repeat sequence (longer length is earlier onset)
 - Through generations (paternal transmission) the sequence tends to increase

Huntington Disease

- Onset typically in the 30's and progresses for 10-20 years until death
- Caused by expansion of a triplet encoding glutamine in the 5' end of the gene.
- Normal allele: 11-34 repeats
- Disease allele: 42-66 repeats
- Pre-symptomatic testing is available, but since disease is incurable, careful education and counseling need to be provided to at-risk individuals



Problem solving 6.



A. Neurodegeneration is caused by a gain of function of toxic compounds

B. Generation of toxic compounds often Influences loss of function of some regulation

Is synaptogenesis (or synaptic homeostasis) involved in neurodegenerative disorders?



ACCADEMIA NAZIONALE DEI LINCEI

CLASSE DI SCIENZE FISICHE, MATEMATICHE E NATURALI

Venerdì 11 maggio 2012, alle ore 14.30, la Prof.ssa Elena Cattaneo terrà una conferenza sul tema:

Huntington. Storia di un gene e delle cellule staminali

Le rivolgo il cordiale invito ad intervenire.

Roma - Palazzo Corsini
Via della Lungara, 10

IL PRESIDENTE
Lamberto Maffei

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