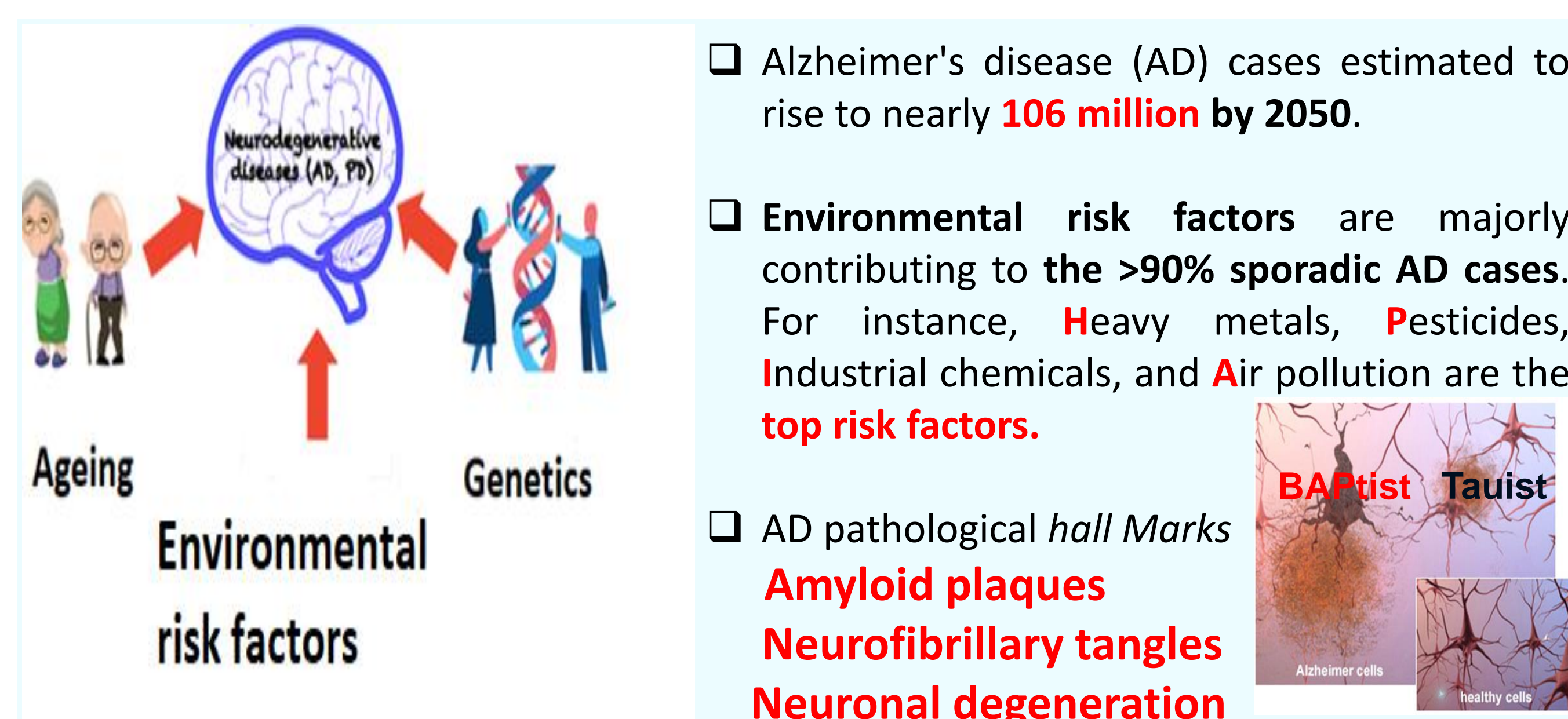


Environmental Risk Factors in Alzheimer Disease

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Top environmental Risk Factors for Sporadic Alzheimer's disease (sAD)

1. Heavy metals

Heavy metal exposure	Human/ Animal/ In vitro Study	Toxicity Outcome
Aluminum	Human	Aggregation of $A\beta_{42}$ forming the amyloid plaques.
Arsenic	Human	Hyper phosphorylation of protein tau.
Cadmium	Human	Increased aggregation of tau protein.
Lead	Human	Affects cognitive function.
Mercury	In vitro	Affect the tau protein function.
Copper	Human	Influence the $A\beta_{40, 42}$ homeostasis.
Cobalt	In vitro	Oxidative stress reason to induce AD.
Iron	Human	Aggregation of $A\beta_{42}$ to form plaques.
Zinc	Human	Affects the Cu, Fe levels in AD.
Selenium	Rat	Damage the acetylcholine neurons in hippocampus region of brain.

3. Industrial Chemicals

Industrial chemical exposure	Human/ Animal/ In vitro Study	Toxicity Outcome
Brominated flame retardants	Rat	Cognitive dysfunction.
Dioxins	Rat	Dementia.
Parabens	Rat	Neurodevelopmental disorder.
Bisphenol A (BPA)	Rat	Inhibit synapsis formation in hippocampus.
Phthalates	Human	Impaired neurodevelopment.

2. Pesticides

Pesticides exposure	Human/ Animal/ In vitro Study	Toxicity Outcome
Organochlorine pesticides (OCPs) [lindane, HCH, Aldrin, Dieldrin, Endosulfan, DDT, DDE]	Children	Cognitive dysfunction.
Organophosphate insecticides (OPIs) [Methyl parathion, Dimethyl parathion, Trichlorfon, Chlorpyrifos]	Children	Cognitive dysfunction.
Carbamates (carbofuran)	Rat	Neurodegeneration in the hippocampus of brain
Fipronil and its metabolites	In vitro	Increased the toxic $A\beta_{42, 43}$ expression.

4. Air Pollutants

Air pollutants	Human/ Animal/ In vitro Study	Toxicity Outcome
Particulate matter (PM)	Mice	Amyloid- β_{40} and β_{42} levels double in mice brains.
Volatile Organic Compounds	Human	Memory impairment.

- Multiple classes of environmental chemicals have been hypothesized to play a role in the sporadic AD.
- In a realistic exposure, chemical mixtures/ cocktail of chemicals may increase the risk of sporadic AD compared to single chemical exposure.

References

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