

Type de communication : communication orale flash affiche

A short trip to the role of metal ions in Alzheimer's disease.

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Résumé :

Alzheimer (AD) is a multifactorial disease where two key events have been linked to the etiology of the disease: (i) the self-assembly process of the Alzheimer-related amyloid- β (A β) peptides leading to the deposits of A β amyloids in the senile plaques detected in AD patients [1] and (ii) oxidative stress.[2] Metal ions (copper, zinc and iron) have been found in the senile plaques in abnormally high level. They can modulate the self-assembly of the A β peptides and A β -bound copper ions can catalyze the production of Reactive Oxygen Species. They are thus key players in the pathology.

During the talk, I will give an overview of the approaches we have devopped in the last years to (i) first understand at the molecular level how metal ions are linked to the fate of the disease [1-3] and to (ii) overcome their deleterious effects by new copper-targeting molecules.[3]

1. Atrian-Blasco, E.; Gonzalez, P.; Santoro, A.; Alies, B.; Faller, P.; Hureau, C., Cu and Zn coordination to amyloids: a chemistry of pathological importance ? *Coord. Chem. Rev.* **2018**, *371*, 38-55.
2. Cheignon, C.; Tomas, M.; Bonnefont-Rousselot, D.; Faller, P.; Hureau, C.; Collin, F., Oxidative stress and the amyloid beta peptide in Alzheimer's Disease. *Redox Biology* **2018**, *14*, 450-464.
3. Esmieu, C.; Guettas, D.; Conte-Daban, et al., Copper-Targeting Approaches in Alzheimer's Disease: How To Improve the Fallouts Obtained from in Vitro Studies. *Inorg. Chem.* **2019**, *58* (20), 13509-13527.

Keywords: Copper ; Zinc; Amyloid-forming peptides; ROS; drug design.

CH acknowledges the ERC StG 638712 ('aLZINK') and CE the ANR COPPERATION for financial support. CH warmly thank the past and current researchers who have contributed to the results that will be illustrated.