

ICONAN 2016

International Conference on **NANOMEDICINE**
And **NANOBIOTECHNOLOGY**

Sept 28-30, 2016
in Paris

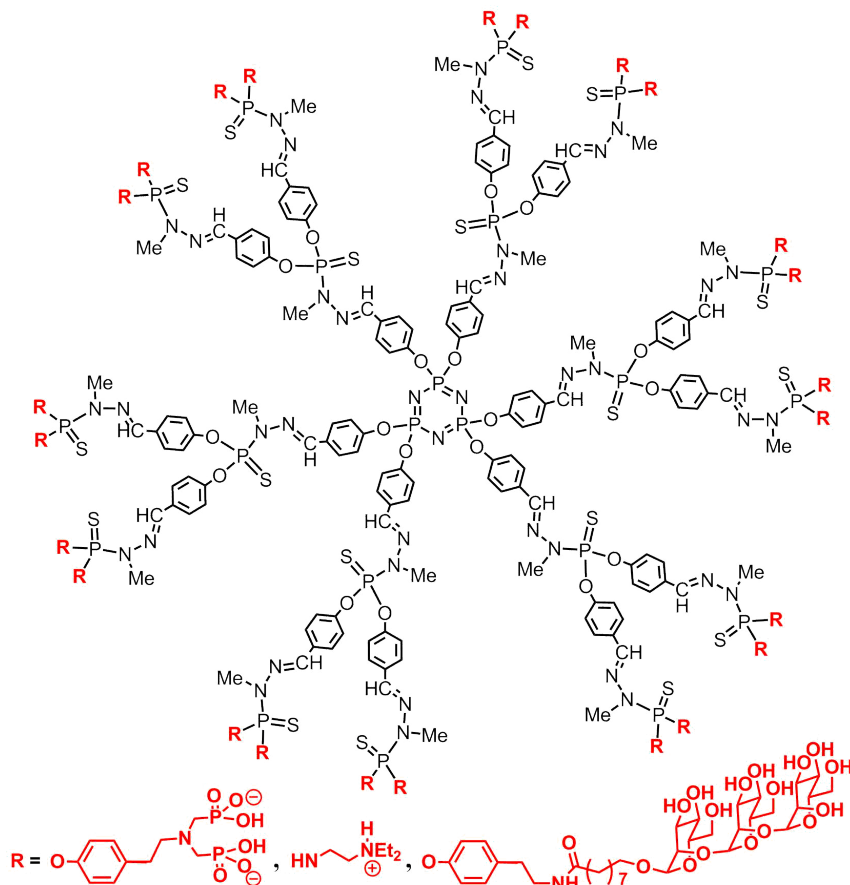


Dendrimers as tools towards nanomedicine

Prof. Anne-Marie Caminade (LCC-CNRS Toulouse)

Dendrimers [1] are hyperbranched and nanosized macromolecules, synthesized step-by-step in an iterative fashion to ensure a perfect control of all their structural parameters (chemical composition, size, weight, etc.), and which may have outstanding properties. [2] Most of these properties of dendrimers depend on their terminal functions, but surprisingly, the internal structure may also play a key role, especially when considering the biological properties. [3]

We synthesize phosphorus-containing dendrimers (i.e. dendrimers having a phosphorus atom at all the branching points), and we can play with both their internal structure [4] and the type of their terminal functions. These dendrimers, when specifically functionalized (see Figure), display many biological properties ranging from transfection to immuno-stimulation, [5] from antivirals to anti-prion, anti-inflammatory [5, 6, 7] and anti-cancer [8] agents. These biological properties of phosphorus-containing dendrimers will be emphasized.



Examples of biologically active functions linked to the surface of a phosphorus-containing dendrimer

References

- [1] Dendrimers. Towards Catalytic, Material and Biomedical Uses. Caminade A.M., Turrin C.O., Laurent R., Ouali A., Delavaux-Nicot B, Eds., John Wiley & Sons, Chichester (UK) 2011.
- [2] Caminade A.M., Ouali A., Laurent R., Turrin C.O., Majoral J.P., Chem. Soc. Rev. 2015, 44, 3890.
- [3] Caminade A.M., Fruchon S., Turrin C.O., Poupot M., Ouali A., Maraval A., Garzoni M., Maly M., Furer V., Kovalenko V., Majoral J.P., Pavan G.M., Poupot R. Nature Comm. 2015, 6, 7722.
- [4] Galliot C., Larré C., Caminade A.M., Majoral J.P., Science 1997, 277, 1981.
- [5] Hayder M., Poupot M., Baron M., Nigon D., Turrin C.O., Caminade A.M., Majoral J.P., Eisenberg R.A., Fournié J.J., Cantagrel A., Poupot R., Davignon J.L., Science Transl. Med. 2011, 3, 81ra35.
- [6] Blattes E., Vercellone A., Eutamène H., Turrin C.O., Théodorou V., Neyrolles O., Majoral J.P., Caminade A.M., Prandi J., Nigou J., Puzo G., Proc. Nat. Acad. Sci. USA 2013, 110, 8795.
- [7] Le Dall J., Fruchon S., Garzoni M., Pavan G.M., Caminade A.M., Turrin C.O., Blanzat M., Poupot R. Nanoscale 2015, 7, 17672.
- [8] El Brahmi N., Mignani S.M., Caron J., El Kazzouli S., Bousmina M.M., Caminade A.M., Cresteil T., Majoral J.P. Nanoscale 2015, 7, 3915.