

Propositions – Stellingen

Linking Cellular and *In Vitro* Microtubule Behavior: Reconstitution Assays to the Rescue

1. Loss of stable hydrogen bonding network and altered electrostatics at the E-site impair GTP hydrolysis in the tubulin A1A mutants P263T and R402H (*this thesis*).
2. CLIP-170 and -115 possess overlapping -or redundant- as well as specific functions (*this thesis*).
3. CLIP-115 accumulates at the ends of shrinking microtubules (MT) before these undergo rescue and it does so independently of EB3 (*this thesis*).
4. CLIP-115 recognizes and binds tyrosinated tubulin (*this thesis*).
5. Adjustments of protein and salt concentrations are often performed in *in vitro* reconstitutions of MTs and represent a point of strength of these assays; however, they must be performed with extreme caution (*this thesis*).
6. The structure of proteins is the key to understand their function, nevertheless it is remarkable how this aspect appears relatively underrepresented in cell biology, which often restricts itself to protein and protein domain functional analysis without protein structure.
7. Molecular dynamics simulations can be considered the materialization of a statement made by R. P. Feynman: "Certainly no subject or field is making more progress on so many fronts at the present moment than biology, and if we were to name the most powerful assumption of all, which leads one on and on in an attempt to understand life, it is that *all things are made of atoms*, and that everything that living things can do can be understood in terms of the jiggings and wiggings of atoms." (*Feynman et al., Feynman Lectures in Physics, vol. I, 3-6 ; Addison-Wesley, Reading; 1963*)
8. If humankind keeps on going as at present, it will likely be at a crossroads: getting extinct or making a leap in science and technology.
9. We are fundamentally chaos and imbalance embedded in a mass of atoms within a self-assigned 4D-reality.
10. "Rien ne se perd, rien ne se crée, tout se transforme". ("Nothing gets lost, nothing gets created, everything is transformed."). (*Traité élémentaire de chimie, Antoine Lavoisier, éd. Cuchet, 1789, Chapitre I, p. 107.*)
11. "Your assumptions are your windows on the world. Scrub them off every once in a while, or the light won't come in." (*Isaac Asimov*)