This EST proposal addresses the ultimate issue of the necessary multidisciplinary training at the interface between top scientific and pre-industrial research in the "Chemistry and Nanoelectronics" domain. This training project for 10 PhD students during 3 years, in the frame of the MINATEC innovation center, will allow a better coupling both between chemistry and nanoelectronics and between scientific and technological research. It will favour a multicultural approach so that experts, researchers, engineers and students can run or take part to multidisciplinary projects, which are crucial for the future of nanoelectronics.

The 3-years positions will be open between spring and autumn 2006. The salary offered will be in the range 24k€-28k€ par year.

To get additional information, please consult http://www-drfmc.cea.fr/chemtronics

Women are actively encouraged to apply.
### PhD subject n°15

**Photosynthetic proteins as antennas for carbon nanotube devices**

<table>
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<tr>
<th><strong>Director</strong></th>
<th>Dr Pascale PHAM (DRT)</th>
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<tr>
<td><strong>Supervisor</strong></td>
<td>Dr. Pascale CHENEVIER (DSM)</td>
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<tr>
<td><strong>Collaboration</strong></td>
<td>François PERRAUT (DRT)</td>
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**Description**
The candidate will investigate the possibility of photosensitizing carbon nanotubes transistors with photosynthetic proteins. The proteins will be deposited on carbon nanotubes by dielectrophoresis and/or chemical affinity.

**Objectives**
- Developing dielectrophoresis as a method for directing deposition of proteins onto chips
- Preserving protein activity in chemical conditions compatible with transistor functioning
- Measuring possible charge or excitation transfers between photoexcited proteins and nanotubes

**Deliverables/Milestones**
- **T0+12**: report on the directed deposition of photosynthetic proteins onto chips using dielectrophoresis
- **T0+24**: investigation study on the functionalization of carbon nanotube transistors by photosynthetic proteins
- **T0+36**: electrical measurements under illumination, thesis manuscript and thesis defense.

**Contacts**
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