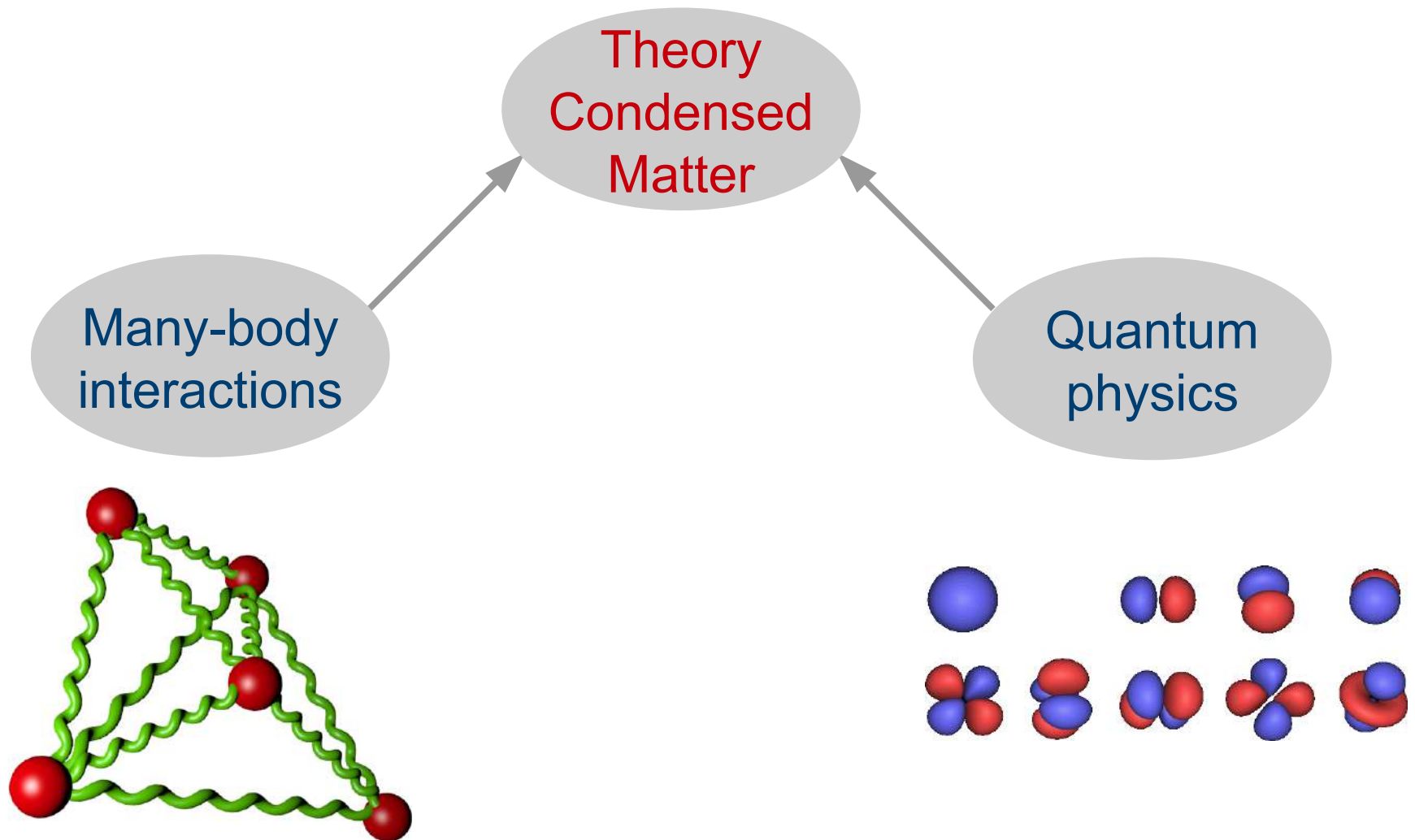


Research in Theory of Condensed Matter

Gareth Conduit

TCM Group, Department of Physics

What is condensed matter physics



Research themes in TCM

Electronic structure

CASTEP and ONETEP \$33million in sales

Collective phenomena

Quantum physics

Biological and soft matter

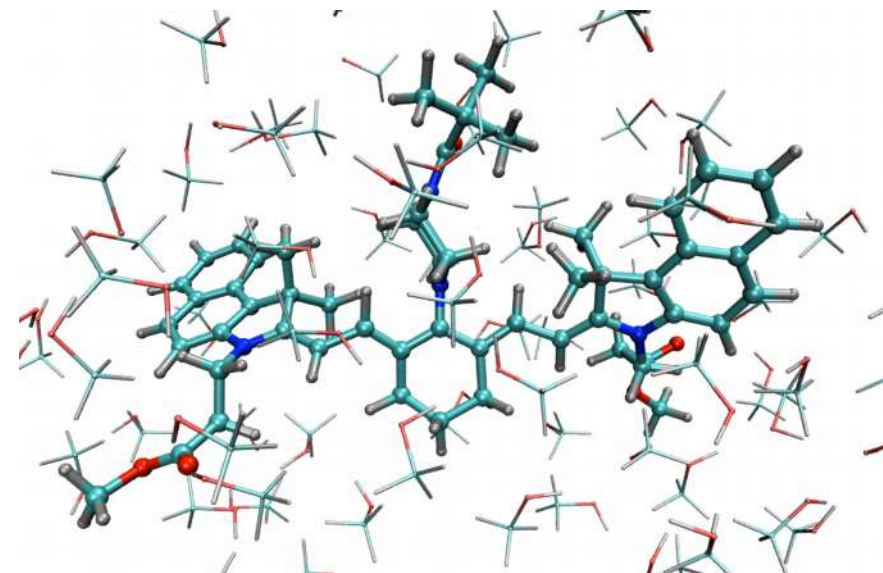
Database analysis

Fluorescent dye

TCM
BSS&POM

Dr Cole, Dr Zuhlsdorff
Dr Bohndiek, J Weber

Outside cancer cell

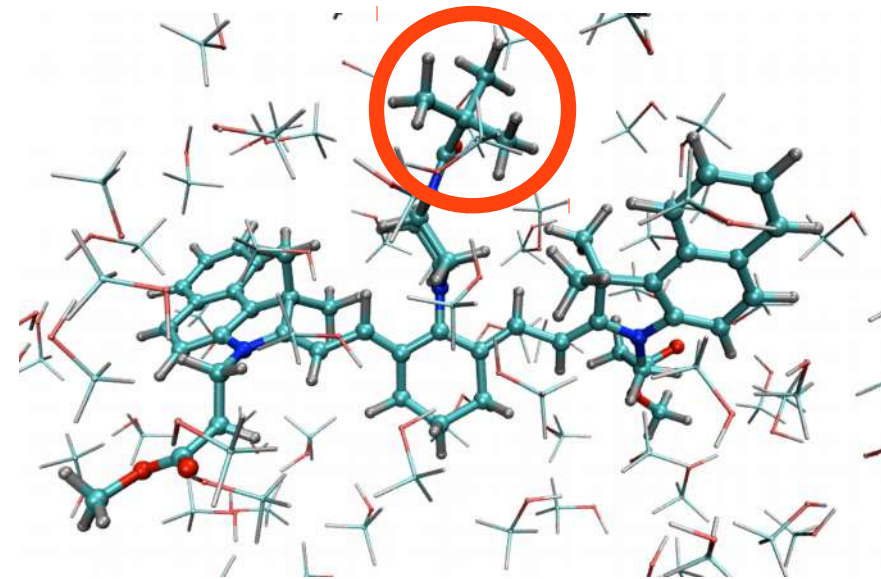


Fluorescent dye inside a cancer cell

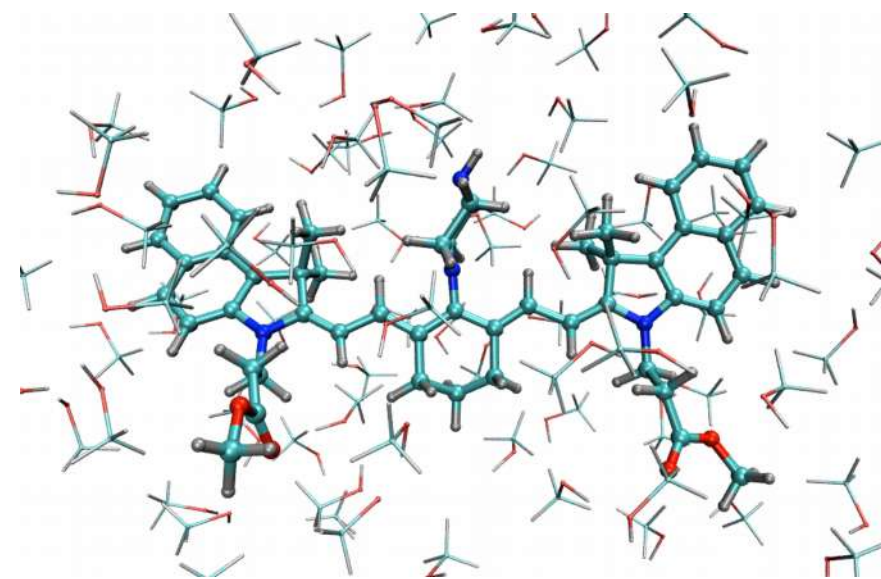
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BSS&POM

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Outside cancer cell



Inside cancer cell

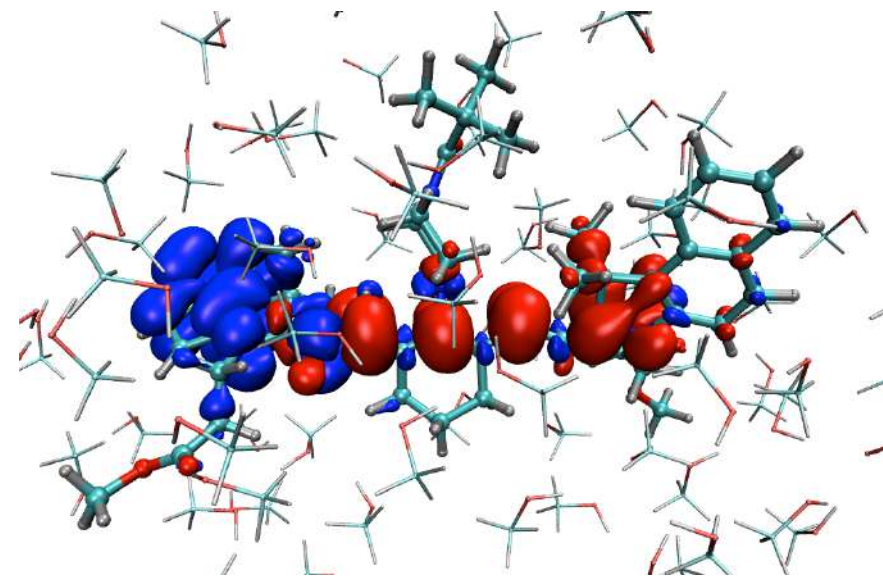


Electrons on the dye

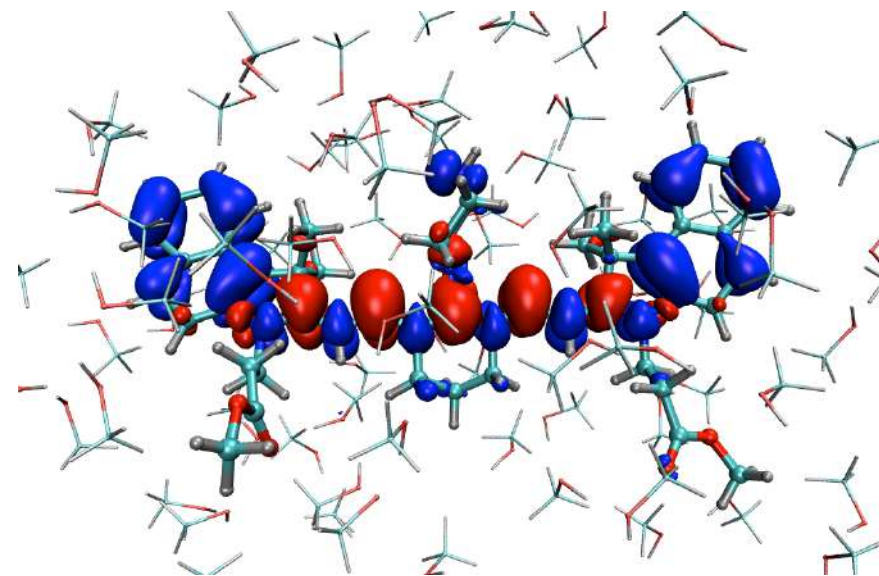
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Outside cancer cell



Inside cancer cell



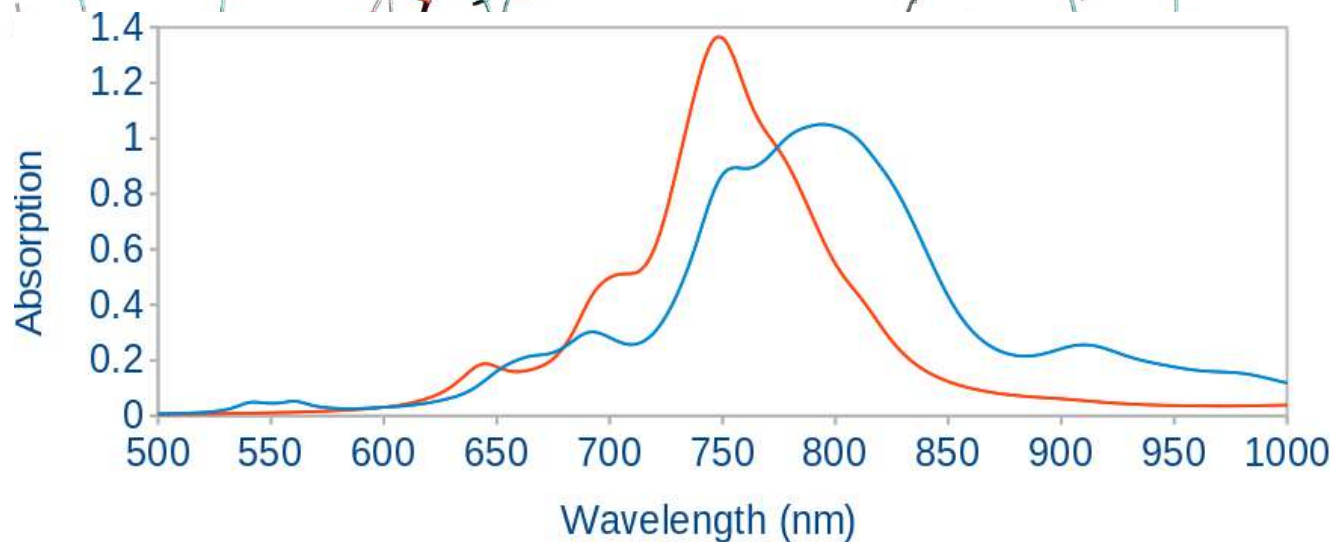
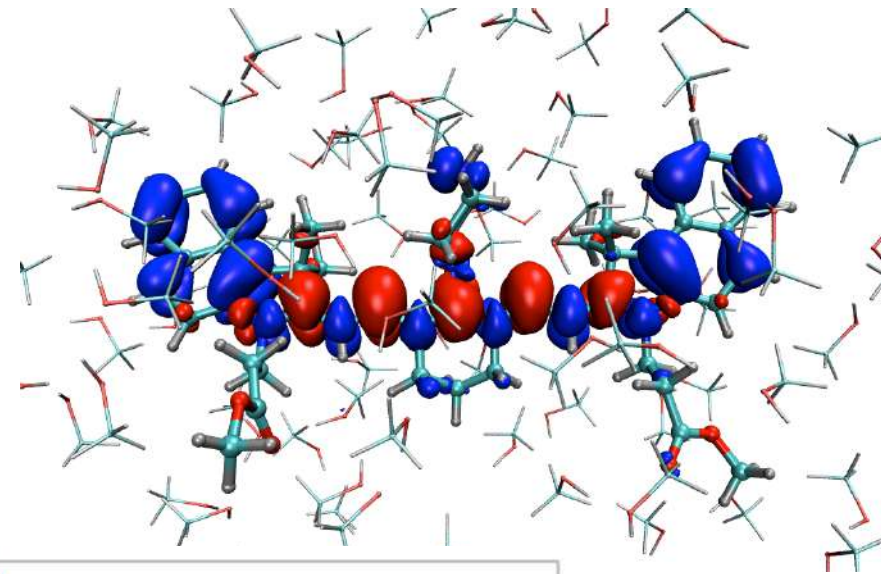
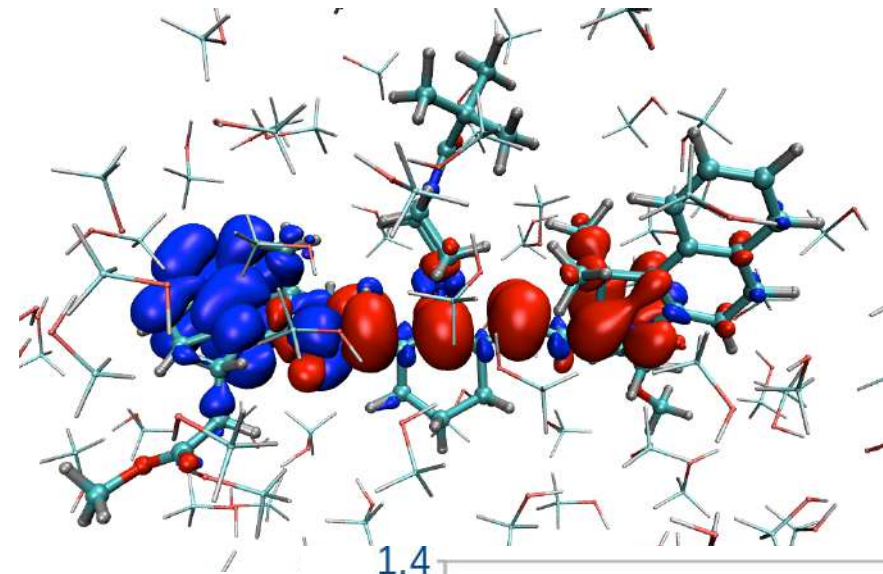
Absorption spectrum of the dye

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Outside cancer cell

Inside cancer cell



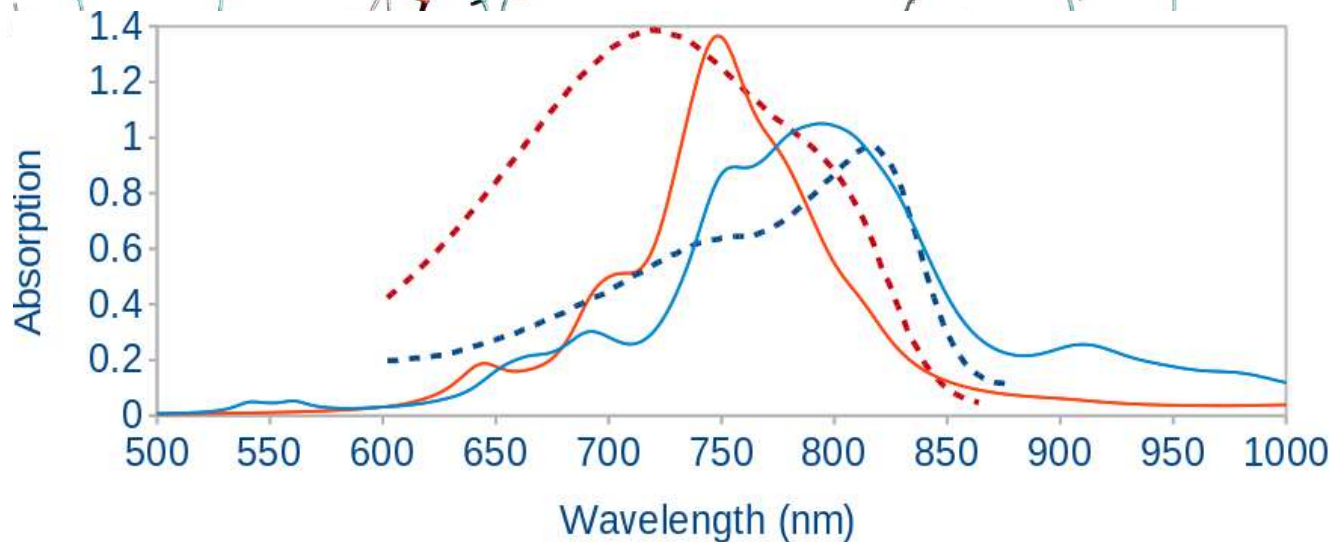
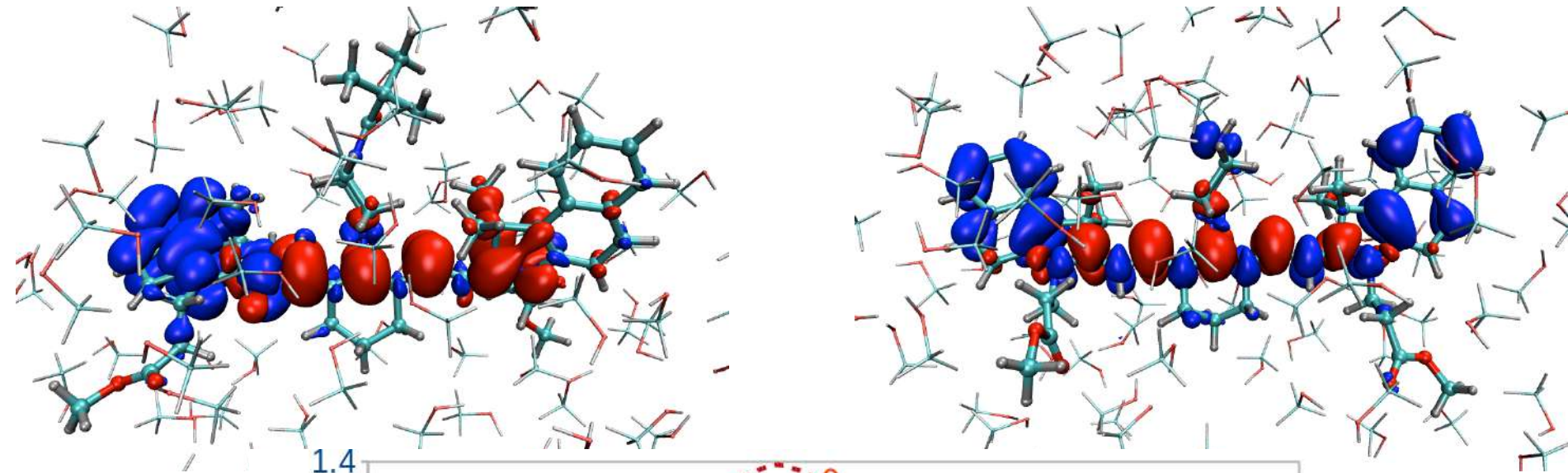
Absorption spectrum of the dye

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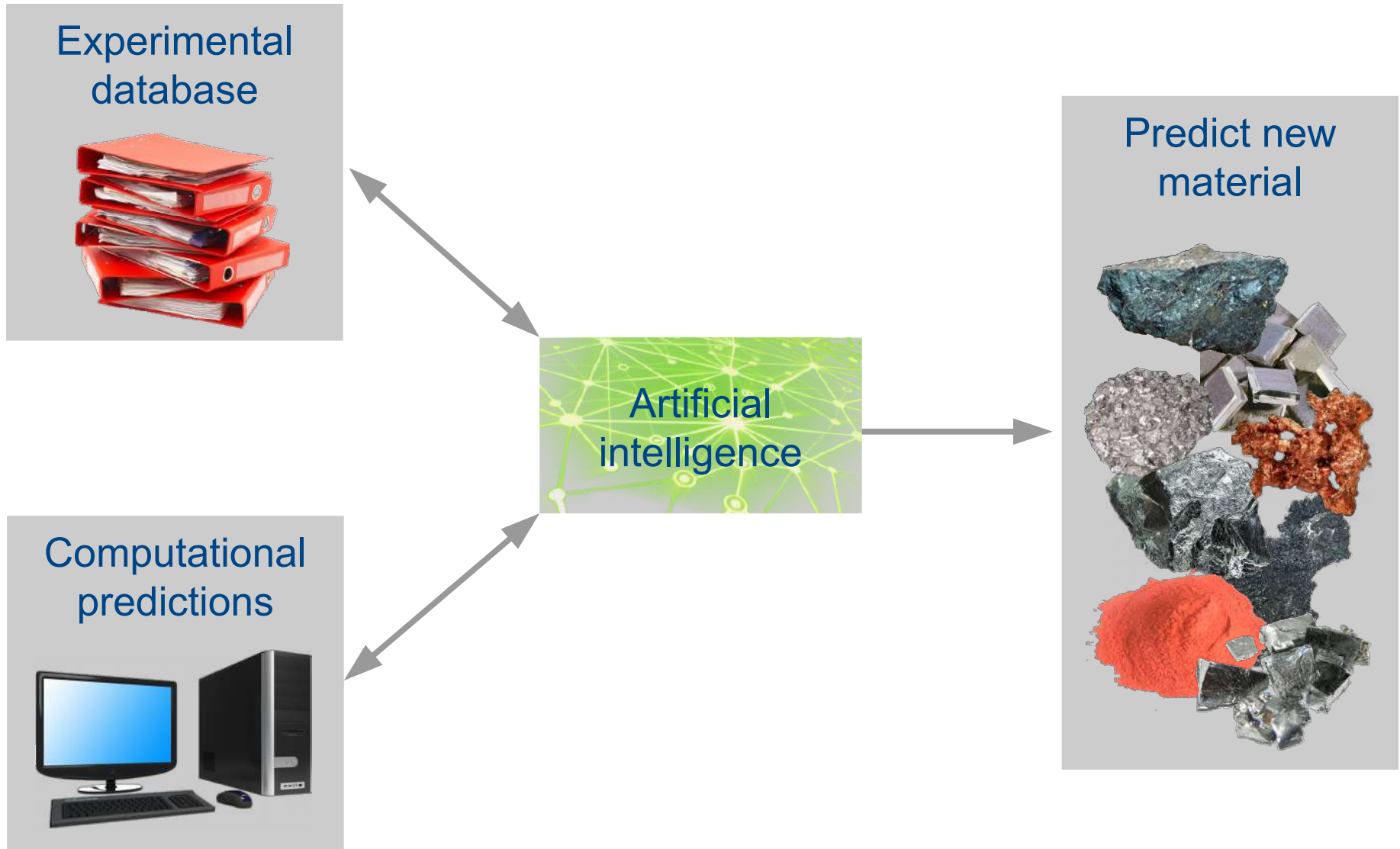
Inside cancer cell



Merging experiment and simulation

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Materials
Industry

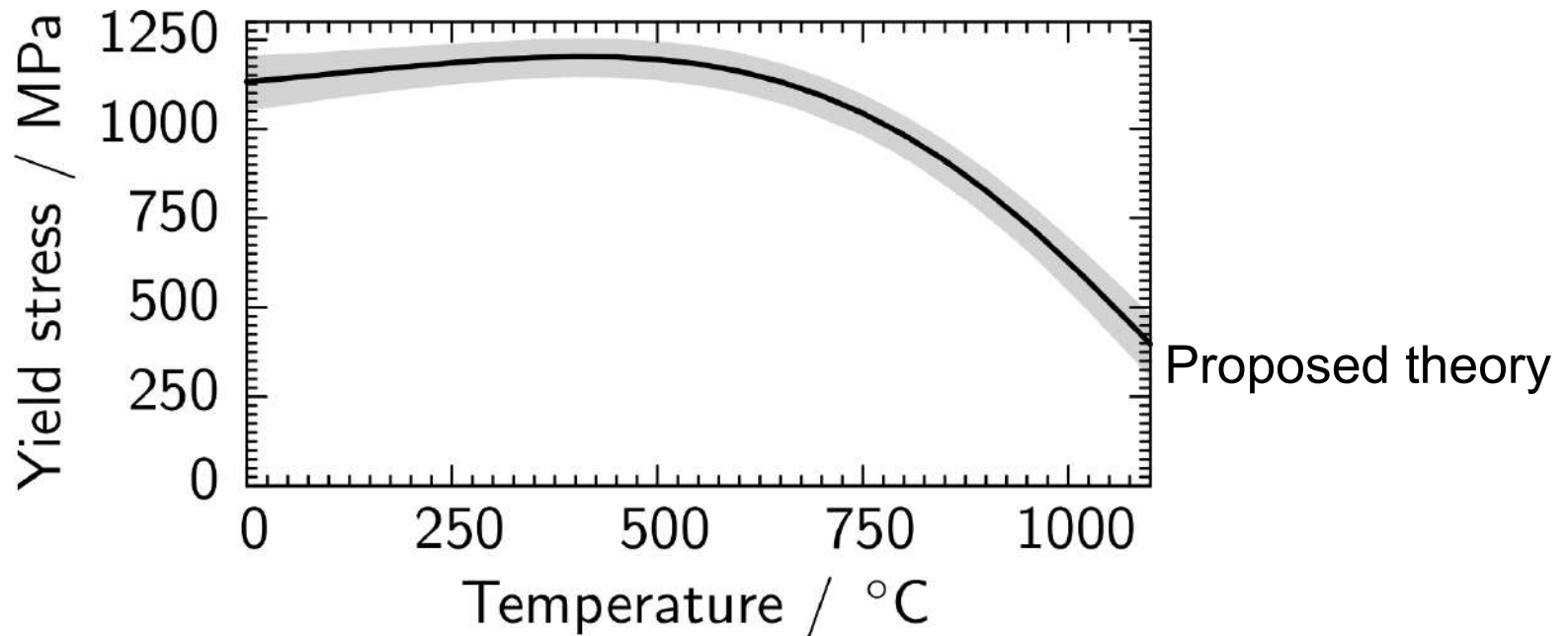
Dr Conduit
Dr Stone, Dr Jones
Granta Design, BP,
Samsung, Rolls-Royce



Testing the yield stress

*TCM
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Industry*

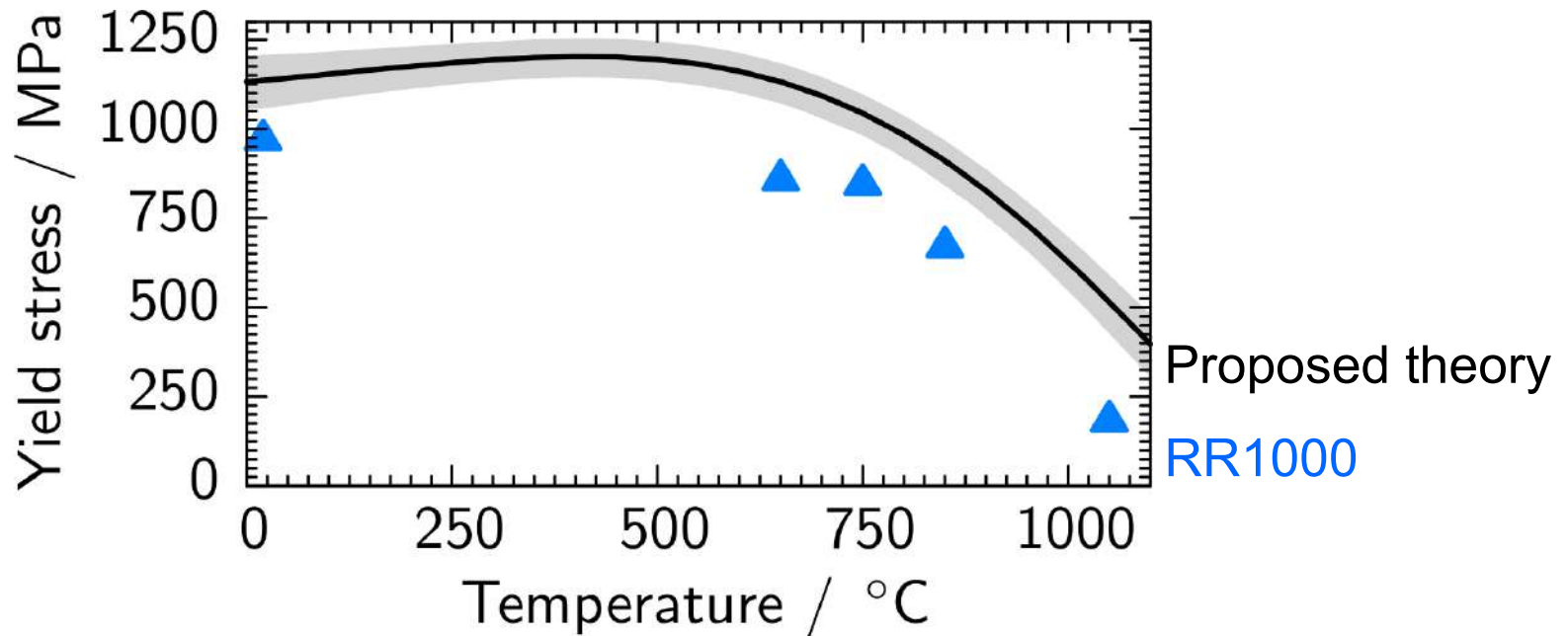
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Granta Design, BP,
Samsung, Rolls-Royce



Testing the yield stress

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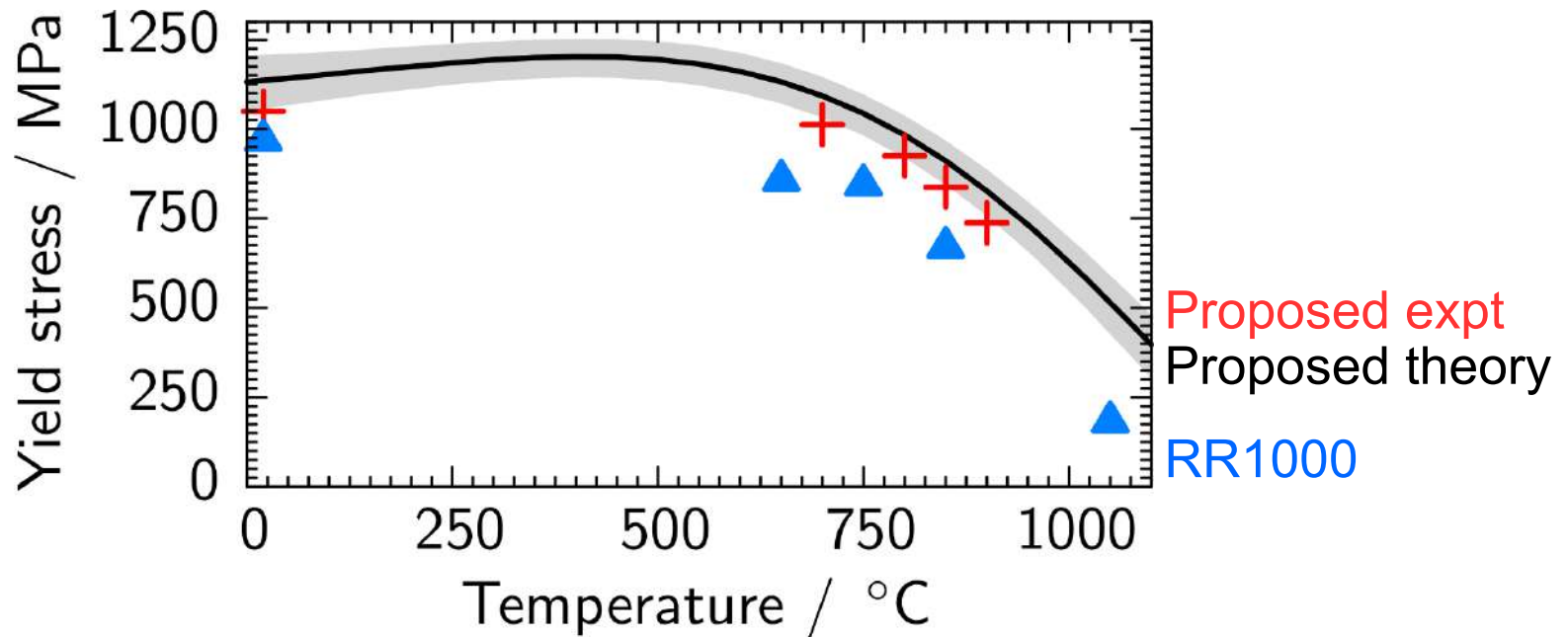
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Testing the yield stress

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Summary

Apply theory to many-component interacting systems

Collaborations across Cavendish, Cambridge, and industry