

## Project proposal template – Faculty studentships Summer 2014

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<i>Project title</i>	<input style="width: 95%;" type="text" value="Conducting Polymer - Inorganic Nanocomposites"/>	<i>Director of Study</i>	<input style="width: 95%;" type="text" value="Dr Richard Singer"/>
<i>Second Supervisor</i>	<input style="width: 95%;" type="text" value="Professor Peter Foot"/>	<i>School</i>	<input style="width: 95%;" type="text" value="Pharmacy and Chem"/>
<i>Other members of supervisory team</i>	<input style="width: 95%;" type="text" value="Dr Roman Kresinski"/>	<i>Any requirements from applicant (eg degree in specific subject area)</i>	<input style="width: 95%;" type="text" value="Chemistry background"/>
<b>Project summary (max 1,000 characters)</b>			
<div style="border: 1px solid black; padding: 10px;"> <p>Organic conducting polymers are now important in mobile phone displays, and are starting to replace conventional materials in other applications. At Kingston, we have made use of the self-organising behaviour of organic molecules such as liquid crystals and intercalation compounds to modify the properties of conducting polymers. In this project, we shall investigate the production of nanocomposites containing single polymer molecules trapped within the pores of inorganics such as SiO<sub>2</sub> or TiO<sub>2</sub>. The composite materials will be based on thiophene derivatives, and they will be introduced into nanoporous inorganic materials produced by sol-gel chemistry in the presence of lyotropic liquid crystals. With careful control of the conditions, the products are expected to contain single molecular wires (1-dimensional conductors) with well-organised structure and unusual electrical and optical behaviour, including efficient light-emitting properties, photocatalysis and possible superconduction.</p> </div>			