3 Year PhD Studentship supported by European Union’s Horizon 2020 research and innovation programme

**Department:** Chemistry

**Supervisor:** Professor Sergey Piletsky Email sp523@le.ac.uk

**Eligibility:** UK / EU applicants only

**Project Title:** Development of a manufacturing process for pilot scale synthesis of MIP nanoparticles for therapeutic studies and plasmapheresis

**Project Description:**

The studentship aims at development of a manufacturing process for pilot scale synthesis of nano-sized molecularly imprinted polymers (nanoMIPs) for therapeutic studies. The main task of the project will be to develop a synthesis of nanoMIPs via anti-idiotype imprinting. Whole virus capsids will be used as templates in producing first generation of nanoMIPs that mimic anti-AAV antibodies. These nanoMIPs will serve as templates in producing second generation of nanoMIPs acting as binders for anti-AAV antibodies. NanoMIPs will be used in producing large quantity of synthetic binders for anti-AAV antibodies. Synthesis of nanoparticles will be made using the automatic solid-phase photoreactor developed by partner ULEIC. Characterisation of the binding between MIPs and antibodies will be made using surface plasmon resonance. Further characterisation will be made using DLS and TEM. Particular attention will be paid to the selection and development of synthetic approaches compatible with large scale manufacturing and leading to the production of nanoparticles with controlled size distribution, physical and chemical properties.

A prototype of a plasmapheresis column based on anti-AAV-specific nanoMIPs bound to a clinically approved plasmapheresis matrix platform will be generated. Efficiency and specificity of depletion of anti-AAV antibodies will be assessed in vitro and in vivo. Binding capacity of prototype column for anti-AAV antibodies and resin specificity will be tested on real samples such as human plasma specimens obtained from commercial sources and IV Ig. The column developed using MIP technology will be carefully compared to commercially available columns for immune absorption focusing on efficiency and specificity of binding of anti-AAV antibodies.

**Funding details:**

3 year fully funded studentship as part of the project “Developing a curative gene therapy for Crigler-Najjar syndrome” (CureCN) supported by European Union’s Horizon 2020 research and innovation programme.
The overall vision of the European research project CureCN is to provide a curative gene therapy for the ultra-rare Crigler-Najjar syndrome (CN). CN is a life-threatening, so far incurable liver disease that affects about one in a million individuals at birth. Caused by the deficiency of a liver-specific substance (uridine diphosphate Glucuronosyltransferase 1A1), toxic unconjugated bilirubin is accumulated in serum and body tissue leading to irreversible neurological damage in the brain. Currently, there is no curing treatment available apart from liver transplantation. Treatment with phototherapy reduces the symptoms, but is very debilitating and loses its efficacy over time. The CureCN consortium joins forces to prove the safety and efficacy of the gene therapy in a clinical trial and to make the treatment available to patients.

**Entry requirements:**

Applicants are required to hold/or expect to obtain a UK Bachelor Degree 2:1 or better in a relevant subject. The University of Leicester [English language](#) requirements apply where applicable.

**How to apply:**

You should submit your application using our [online application system](#).

Apply for Chemistry Research

In the funding section of the application please indicate you wish to be considered for European Union’s Horizon 2020

In the proposal section please include the name of the supervisor and project title.

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