# Abstract Template

**Abstract Title:** Peptides, Peptide-polymer conjugates and Polymer-based peptidomimetics of Cell Penetrating Peptides and/or Antimicrobial Peptides

Deirdre Fitzgerald-Hughes[1], Sally-Ann Cryan[2], Marc Devocelle[3]*

[1] *Department of Clinical Microbiology (RCSI, Ireland)*
[2]*School of Pharmacy (RCSI, Ireland)*
[3]*Department of Chemistry (RCSI, Ireland)*

**Abstract (not more than 300 words)**

Peptides are an emerging class of new therapeutic candidates. The total peptide drug market was estimated at $50 billion in 2015 and, with a projected annual growth rate of approximately 10%, is expected to exceed $70 billion by 2019. They are approved and in development in a large number of therapeutic areas, including metabolic diseases, endocrinology, oncology, gastroenterology, cardiovascular, neurology… Antimicrobial Peptides (AMPs) and Cell Penetrating Peptides (CPPs) are other promising peptide candidates with therapeutic applications.
Peptides, however, have a number of shortcomings impending their direct clinical application. They are essentially a lack of oral bioavailability and metabolic stability, a reduced serum half-life, an inability, generally, to reach intracellular targets, a potential toxicity and a high cost of production. The chemical and drug developments of therapeutic peptides generally require therefore a technology addressing their clinical shortcomings.
Three approaches, applied to CPPs and/or AMPs, will be discussed. They include prodrugs of AMPs, activated by disease-associated enzymes. These prodrugs can be selectively activated at sites of infection, preventing the toxicity of AMPs at normal body sites (*in vitro* and *in vivo*). Polymer conjugates of these peptides can also be used to selectively deliver AMPs with anticancer properties to tumour cells. Finally, novel polymer-based peptidomimetics of CPPs and AMPs will be presented. Their activities as transfection reagents (CPP mimetics) or antimicrobial agents (AMP mimetics) surpass, or match those of the parent peptides, respectively, while being metabolically stable and, as demonstrated with the CPP mimetics, devoid of toxicity and cheaper (30 fold) to produce.

Keywords—*Antimicrobial Peptides, Cell Penetrating Peptides, Peptide prodrugs, Polymer-based peptidomimetics.*

**Professional Biography (100-150 words)**

Marc Devocelle has completed his PhD at the University of Lille (France) under contract with a pharmaceutical company. He subsequently joined RCSI (Royal College of Surgeons in Ireland) in 1999 as a postdoctoral researcher and became manager of the Peptide Synthesis Laboratory in 2000. He has since been appointed as a Lecturer in 2004, a Senior Lecturer in 2008 and an Associate Professor of Chemistry in 2014. His laboratory is involved in over 25

collaborations with academic groups across 9 Higher Education Institutions in Ireland and 2 SMEs.



Email Id: mdevocelle@rcsi.ie

**Any Comments:**