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Long-acting injectable D and L- α peptide hydrogels for HIV/AIDS treatment and prevention

Poster P13

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Rationale

- E.g. HIV/AIDS: Sexual transmission and mother to child transmission, two major causes of HIV/AIDS infection.
- The challenge is overcoming patient medication adherence issues with drugs for HIV/AIDS.
- Need for a convenient and effective long-acting formulation to deliver drugs over a sustained period of time e.g. 28 days.

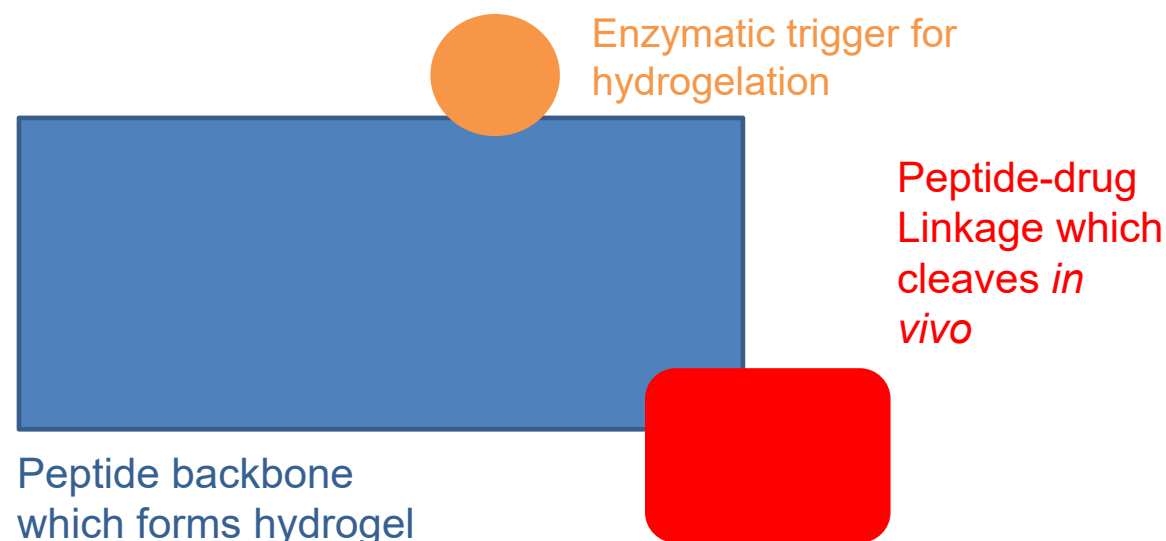
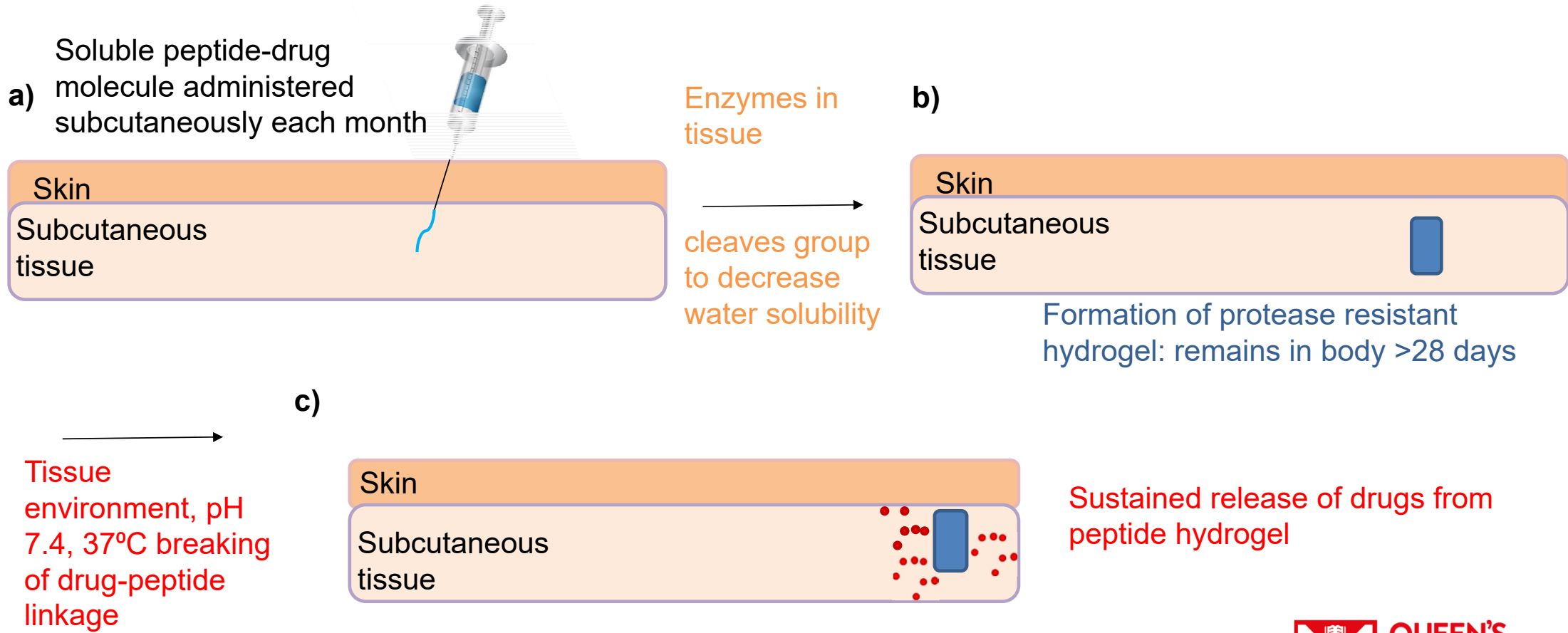


Figure 1. Structural overview of our enzyme responsive peptide drug delivery implant

Peptide hydrogelators for sustained delivery of drugs



Advantages compared to current long-acting injectables

Limitations of current long-acting injectable technologies	Our approach
<p><u>Fast drug/“burst” release</u> after insertion leading to potential toxicity issues/concerns over-dose received</p>	Combination of hydrogel formation and breakage of peptide-drug bond = <u>significant reduction in “burst” release</u> .
<p>Need for <u>surgery</u> for implant insertion and removal.</p>	Administered as a <u>soluble injection</u> . Hydrogel <u>breaks down to non-toxic products</u> <i>in vivo</i> after 28 days
<p>A requirement for <u>large needles</u> (e.g. nanosuspensions)</p>	Formulation is fully soluble in water. Enables <u>use of narrow bore needles</u> improving ease of administration to variety of body sites.
<p><u>Stability issues</u> upon storage/transport (e.g. due to temperature changes) which can result in clogging of syringes and incomplete dosing of drugs for suspension-based products.</p>	Can be transported as powder for mixing with water prior to injection. <u>Increased stability</u> to temperature fluctuations.
<p>Limit on <u>type and amount of drug</u> that can be incorporated, e.g. suspensions limited to use of water-insoluble drugs.</p>	Drug precisely attached to peptide. Therefore, <u>increased drug loading</u> to meet therapeutic need for e.g. 28 days. Vast range of hydrophobic and hydrophilic drugs can be attached.