Development of nanoscale medicines

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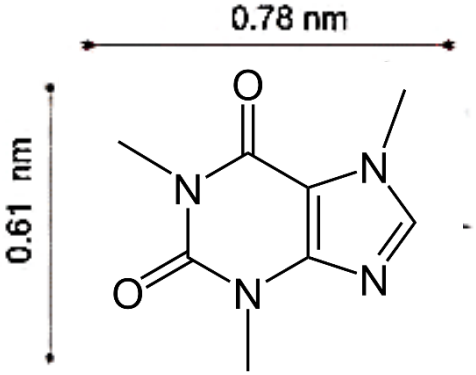
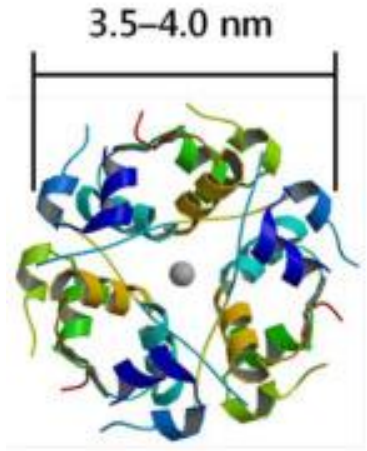
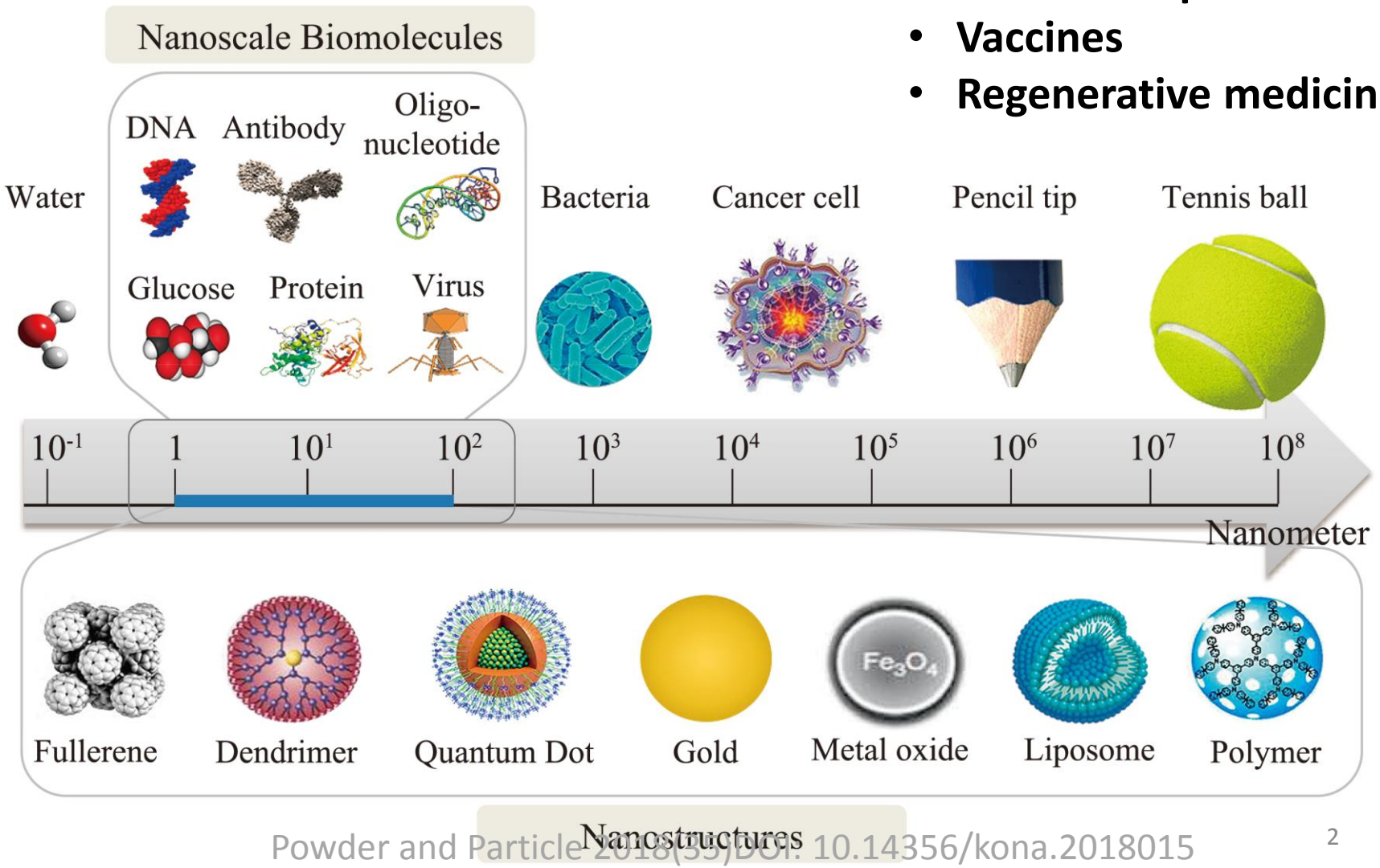
Nanoscale medicines

- Diagnostics
- Medical Imaging
- Nano-therapeutics
- Vaccines
- Regenerative medicine





Insulin hexamer

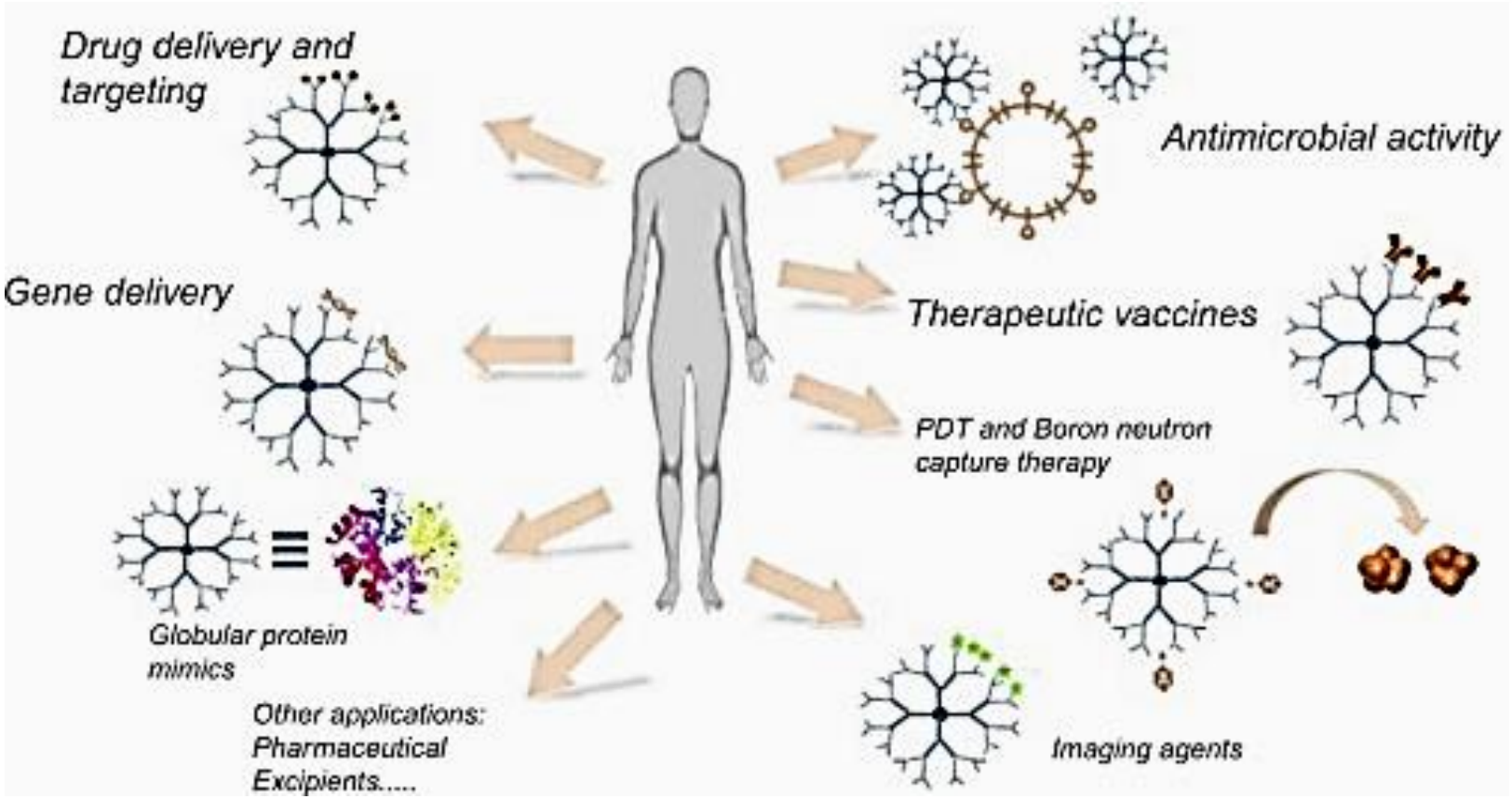


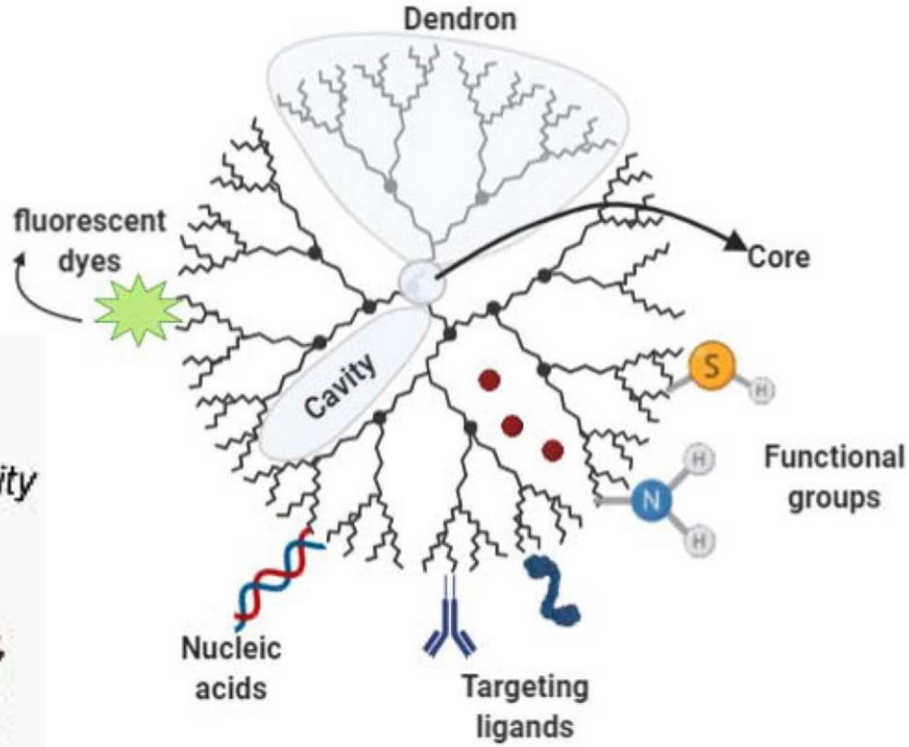
Powder and Particle 2018(35)DOI: 10.14356/kona.2018015

The potential of nanomedicine

- Nanomedicine is the application of nanotechnology to achieve innovation in healthcare.
  - The properties of a nanomaterial are often differ in terms of physics, chemistry or biology from the same material at a bigger scale.
  - The nanometric size allows nanomaterials to potentially cross natural barriers to access new sites of delivery
    - to interact with DNA or small proteins at different levels
- Approximatively 80 marketed nanomedicine products, rang from nano-delivery and pharmaceutical to medical imaging, diagnostics and biomaterials.
  - has nowadays hundreds of products under clinical trials, covering all major diseases including cardiovascular, neurodegenerative, musculoskeletal and inflammatory.

The applications of Dendrimer in biomedicine

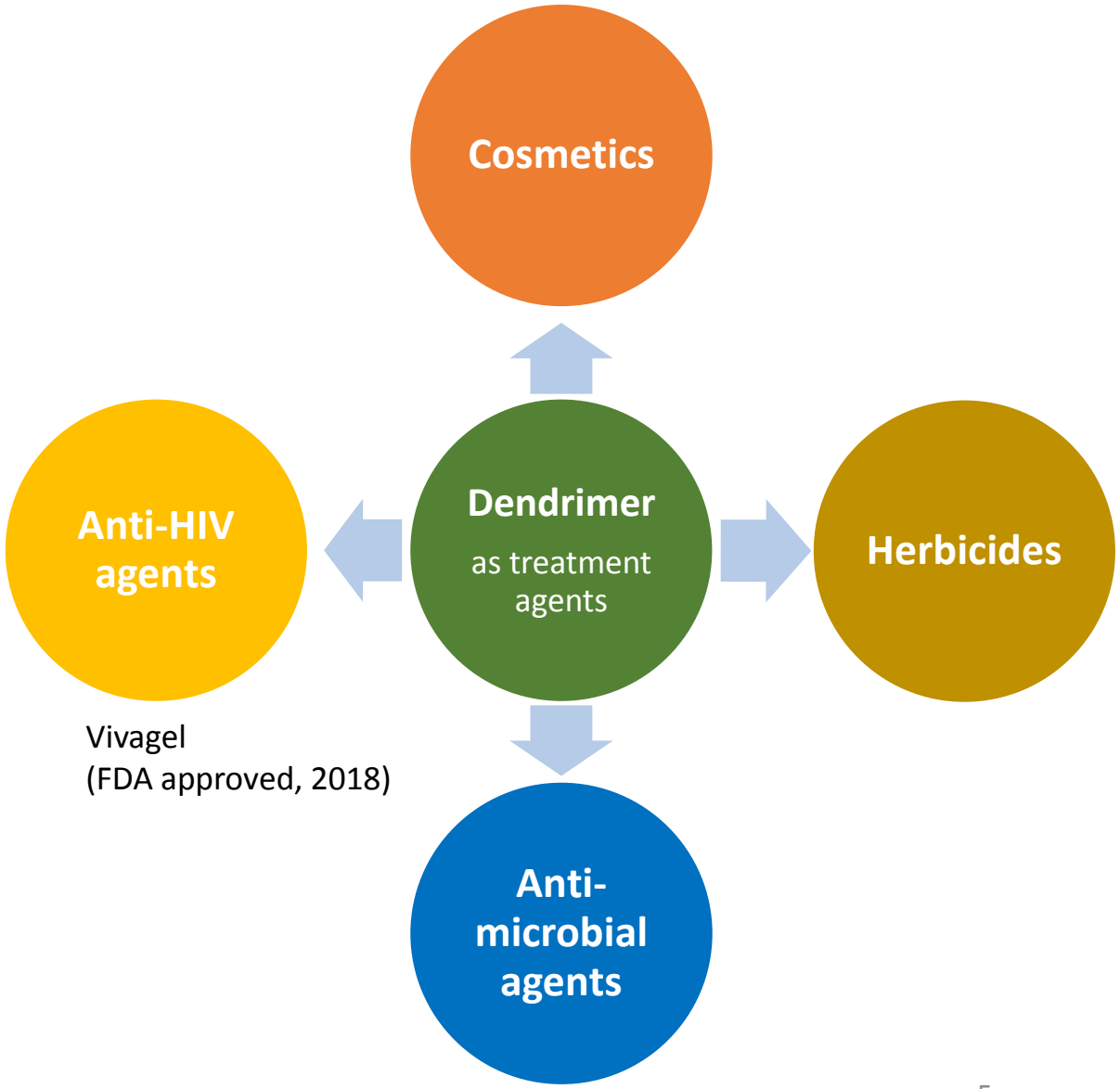




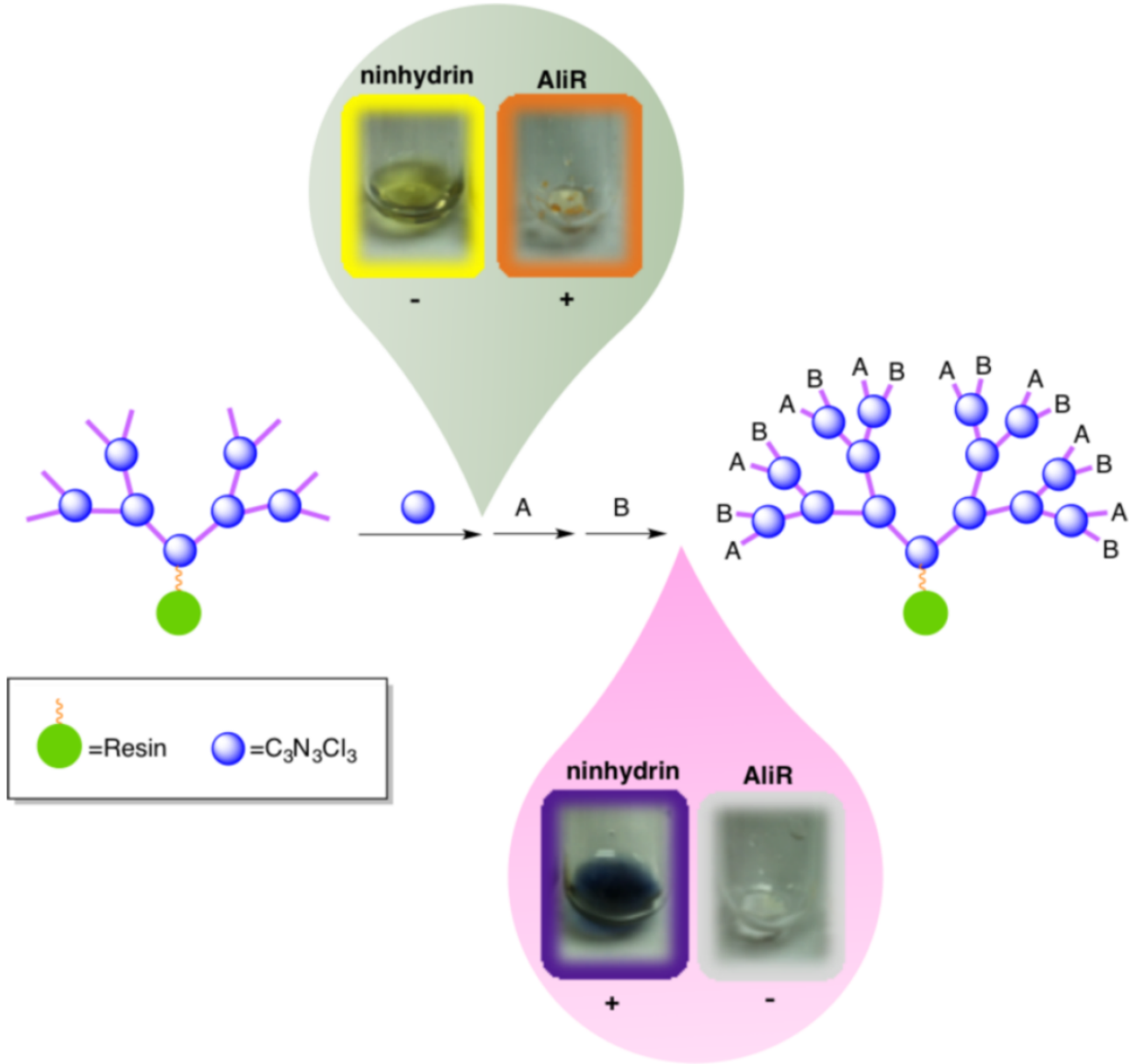
1. Dendrimer-Based Nanotherapeutics, 2021, Pages 163-182
2 Front. Bioeng. Biotechnol. 2020, 8:79. DOI: 10.3389/fbioe.2020.00079

Features and challenges of Dendrimers

- The special features of dendrimer
  - Nanometer size range and uniform molecular weight
  - Three-dimensional structure with peripheral groups
- The challenges that dendrimer used in the medical applications
  - mass-production
  - purity and monodispersity



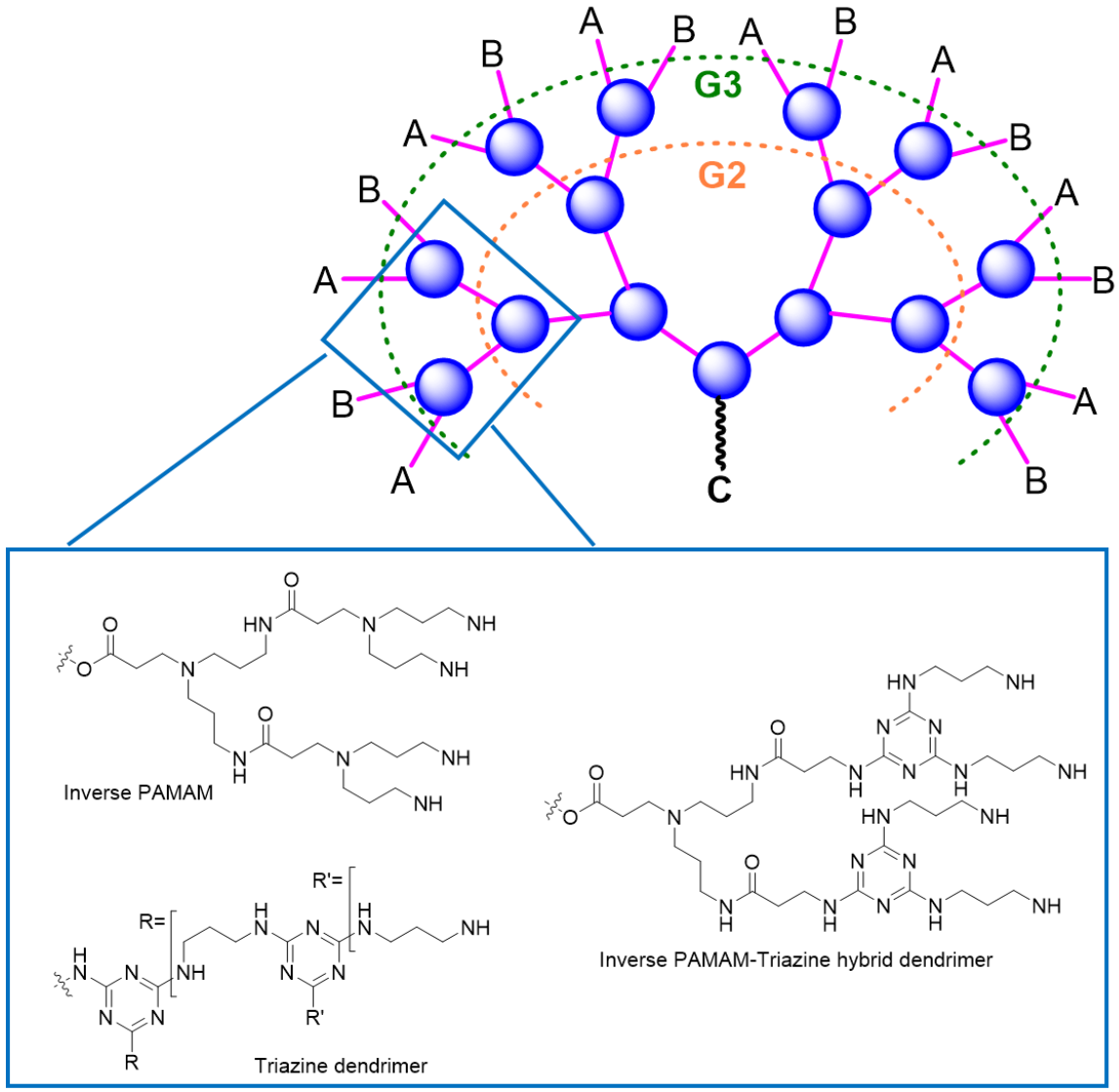
Solid phase synthesis of dendrimer



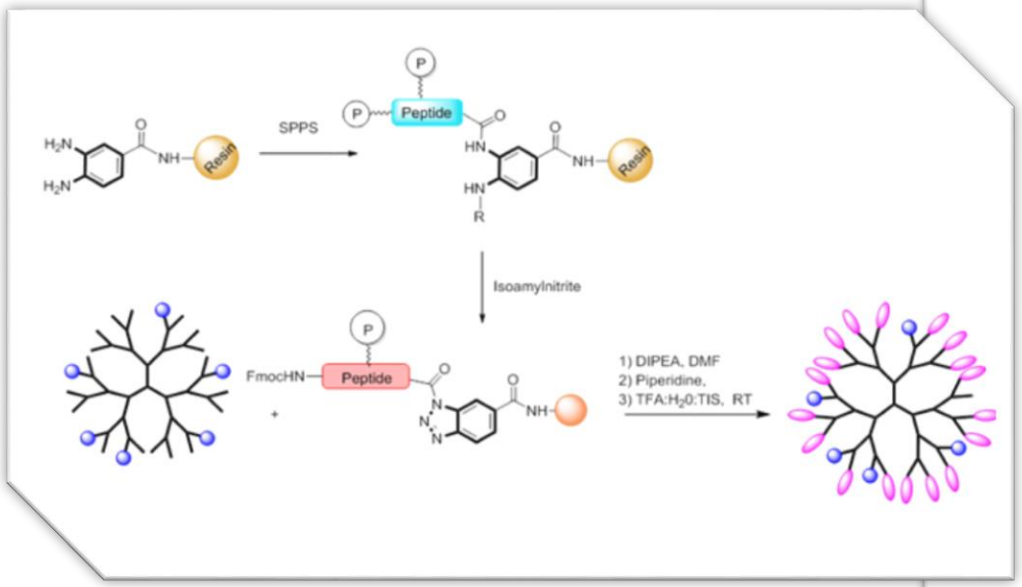
- Efficient
- High purity
- Economic

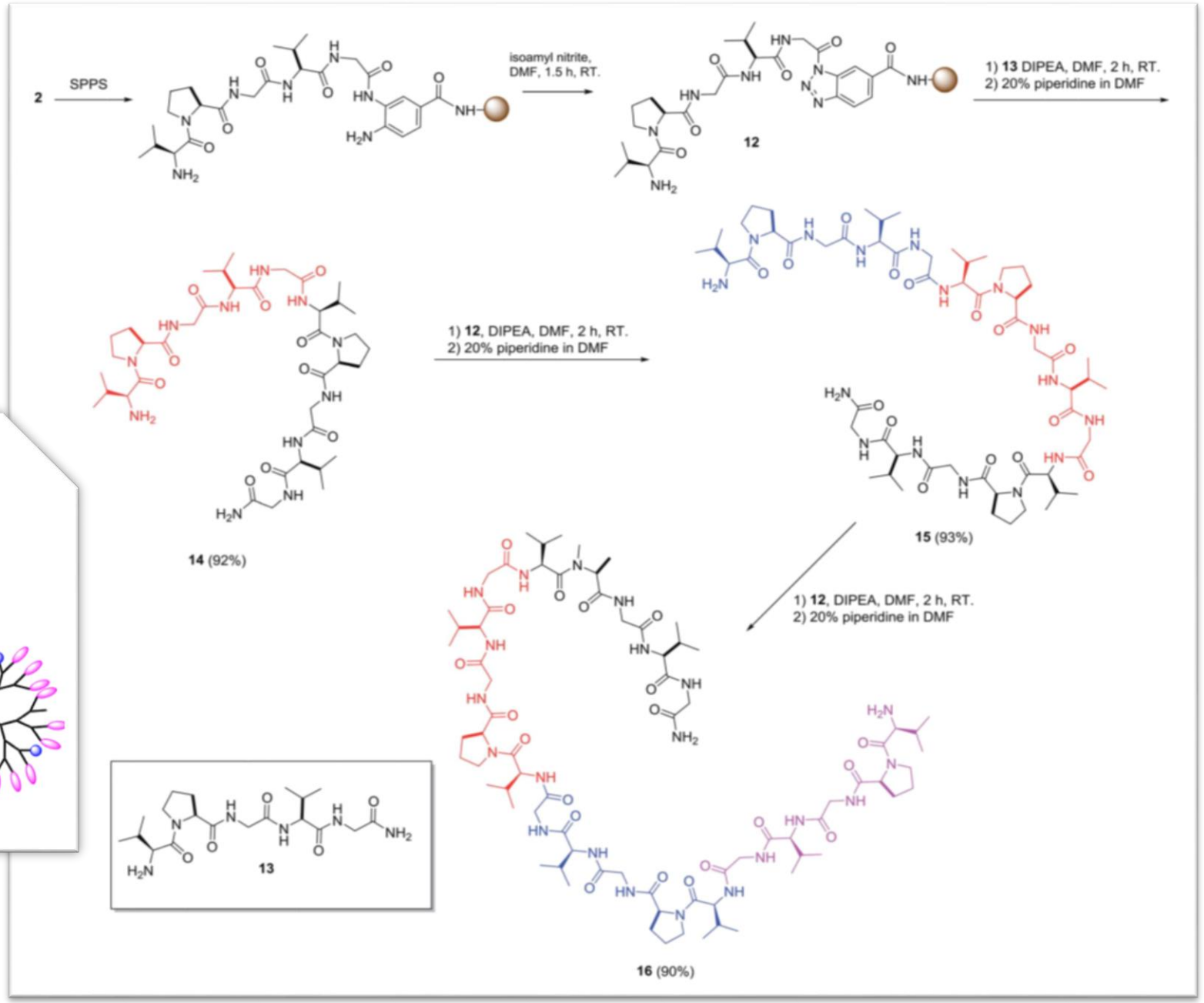
Structural diversities of dendrimers

- Skeleton
- Surface
- Conjugate



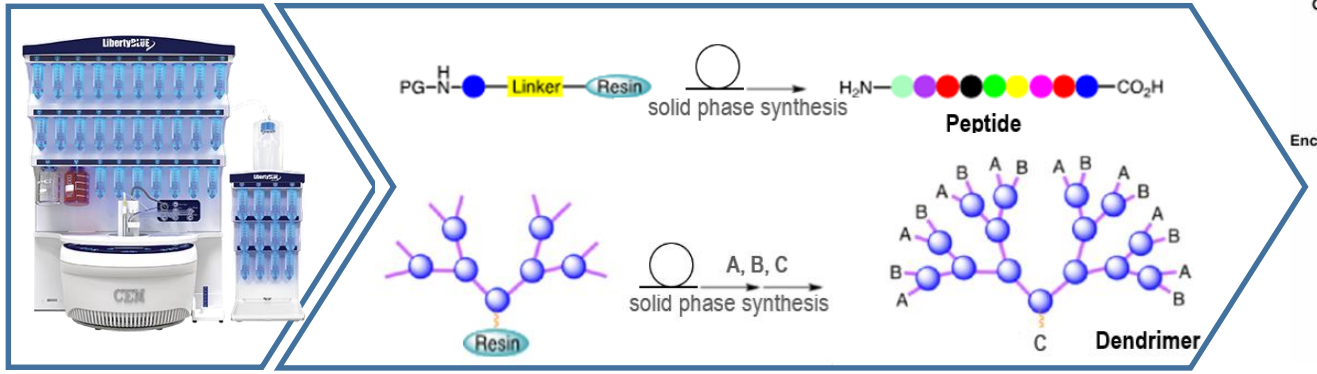
on-Bead ligation



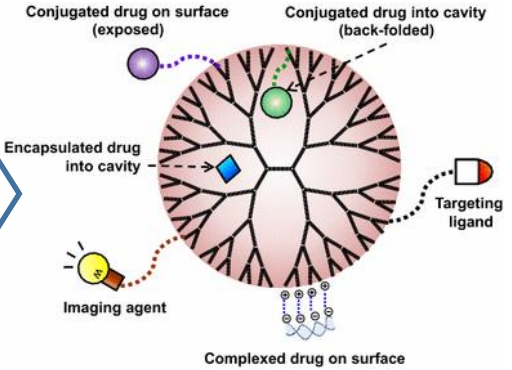


Project

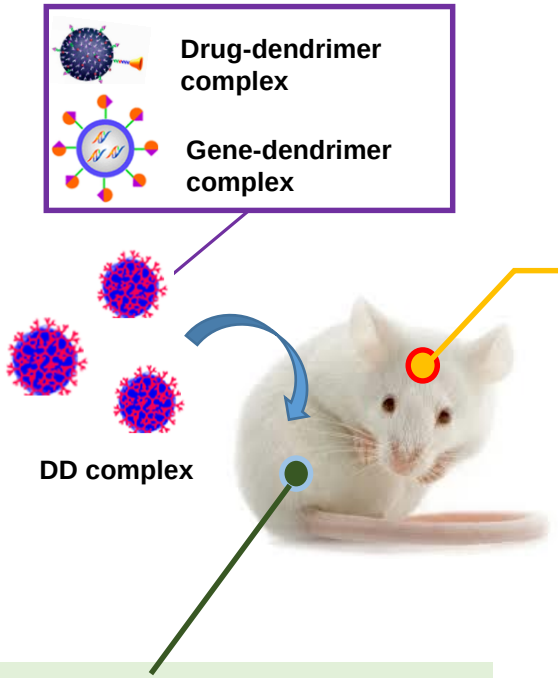
Development of Brain Targeted Delivery Systems



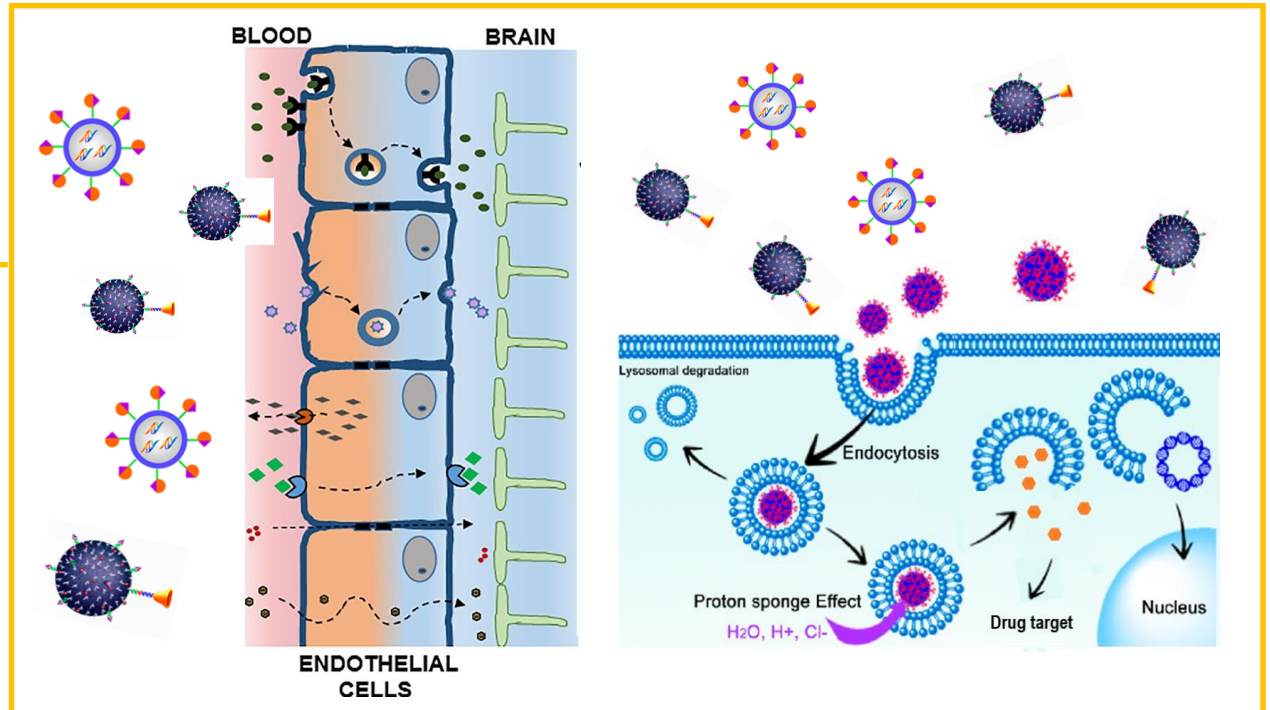
A, B, C= ligand, receptor, drug, antibody, gene, oligonucleotide, imaging agent, solubilizing agent



Complexation of drugs or diagnostics with dendrimer (DD complex)



Reduce side effects



Improve BBB penetrating, Enhance therapeutic effect

可學習能力

- **專業**
  - 固相合成技巧
    - 胜肽、樹狀分子合成和鑑定
  - 藥物開發
    - 胜肽、巨分子藥物設計
    - 骨科、腦科、癌症、顯影藥物設計
  - 儀器分析技術
  - 研究設計與實踐
  - 產業趨勢熟悉

- **軟實力**
  - 獨立自主
  - 解決問題
  - 視野突破

尋找~~好奇樂觀、願意挑戰、
獨立自主、積極主動
～對未來有更多夢想的你

歡迎加入我們的研究團隊

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