Table 3: Properties of different categories of protein-based building blocks with potential applications in nanoscale drug delivery. Main pitfalls are stressed.

| Category | Origin | Procedure | Cage/shell formation | Functional versatility | Architectonic versatility | Delivered drugs | Representative examples or reviews |
|---|---|---|---|---|---|---|---|
| Natural viruses | Natural | Cell culture | Yes | Limited (tropism can be re-directed; severe side effects) | None | Mainly DNA | (Giacca, M. et al. 2012) |
| VLPs | Natural | Recombinant | Yes | Limited (tropism can be re-directed) | Limited (disassembling and reassembling can be controlled in vitro) | Nucleic acids, proteins and chemicals | (Fang, C. Y. et al. 2012;Kaczmarczyk, S. J. et al. 2011;Zhao, Q. et al. 2011) |
| BMCs | Natural | Recombinant | Yes | Limited (BMC proteins can be engineered) | Very limited | Proteins and chemicals | (Seebeck, F. P. et al. 2006;Sutter, M. et al. 2008) |
| Vaults | Natural | Recombinant | Yes | Limited (vault proteins can be engineered) | Very limited | Proteins, chemicals and gold probes | (Goldsmith, L. E. et al. 2009;Gopinath, S. C. et al. 2005;Kickhoefer, V. A. et al. 2005) |
| IBs | Bioinspired | Recombinant | No | High (essentially any protein can form IBs; tropism can be conferred) | Limited (Size and geometry are regulatable) | Proteins | (Liovic, M. et al. 2012;Talafova, K., Hrabarova, E., Chorvat, D. A., & Nahalka, J. 2013;Vazquez, E. et al. 2012) |
| Peptides | Usually bioinspired | Chemical synthesis | No | Moderate (essentially any short aa sequence can be produced) | High (self-assembling can be engineered) | Nucleic acids and chemicals | (Hosseinkhani, H., Hosseinkhani, M., Khademhosseini, A., Kobayashi, H., & Tabata, Y. 2006;Hsieh, P. C., Davis, M. E., |

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| | | | | | | | Gannon, J., MacGillivray, C., & Lee, R. T. 2006) |
| Modular proteins | Bioinspired | Recombinant | Yes | High (essentially any protein and peptide set can be combined) | Moderate ( through protein engineering) | Nucleic acids and proteins | (Unzueta, U. et al. 2012;Unzueta, U. et al. 2012;Vazquez, E. et al. 2010) |