

Mapping the innovation landscape of peptide and protein hydrogels through patent analysis

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INTRODUCTION

Peptide and protein hydrogels are innovative biomaterials that have garnered significant attention in biomedical applications. Both types of these hydrogels exhibit unique biological properties that make them suitable for various applications such as tissue engineering, 3D bioprinting, and so on.

Despite their advantages, issues such as stability, reproducibility, and clinical translation remain significant hurdles for the development and application of such hydrogels.

Patent analysis can provide valuable insights into emerging technologies, trends, and opportunities for innovation in the field of the development and application of hydrogels based on peptides and proteins.

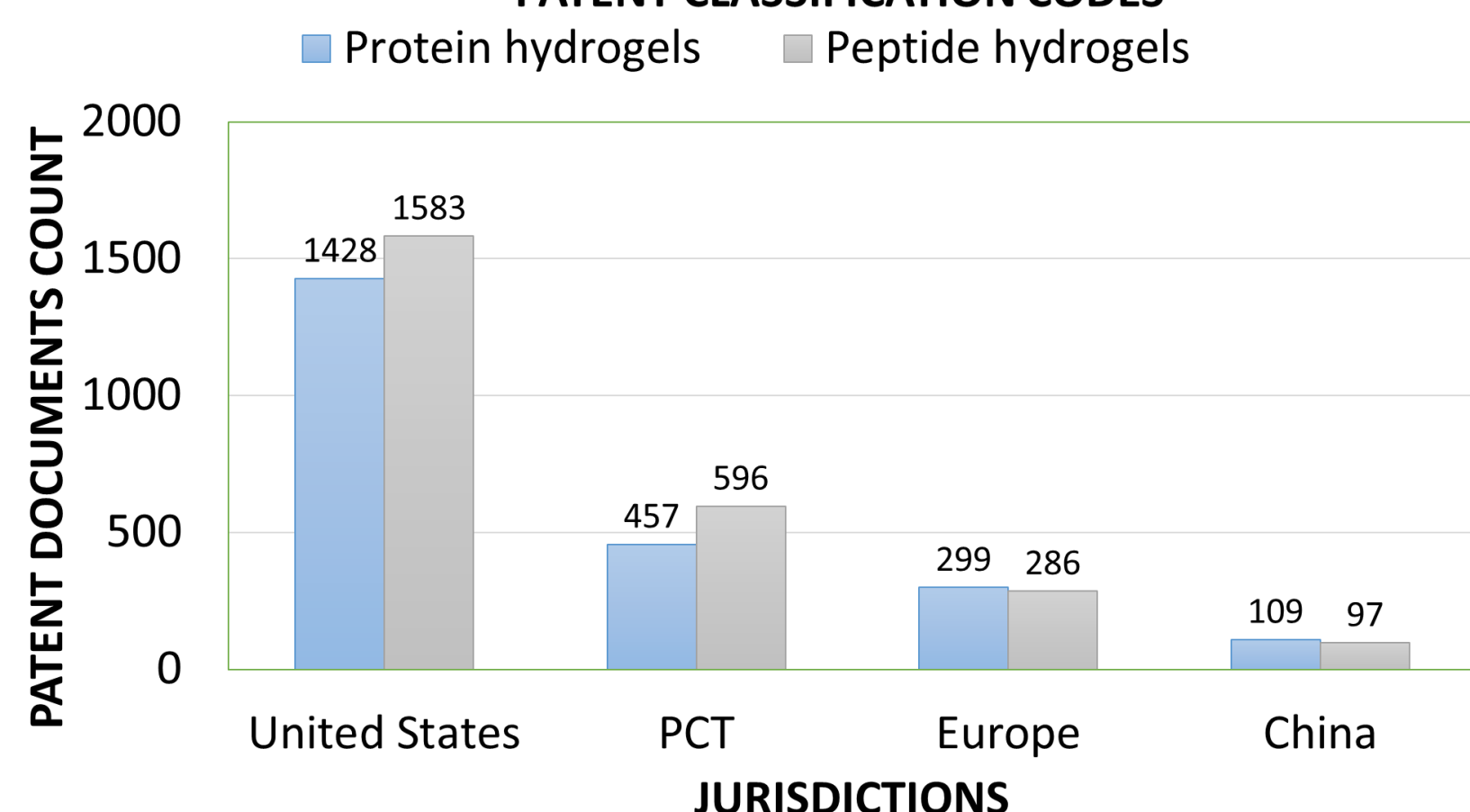
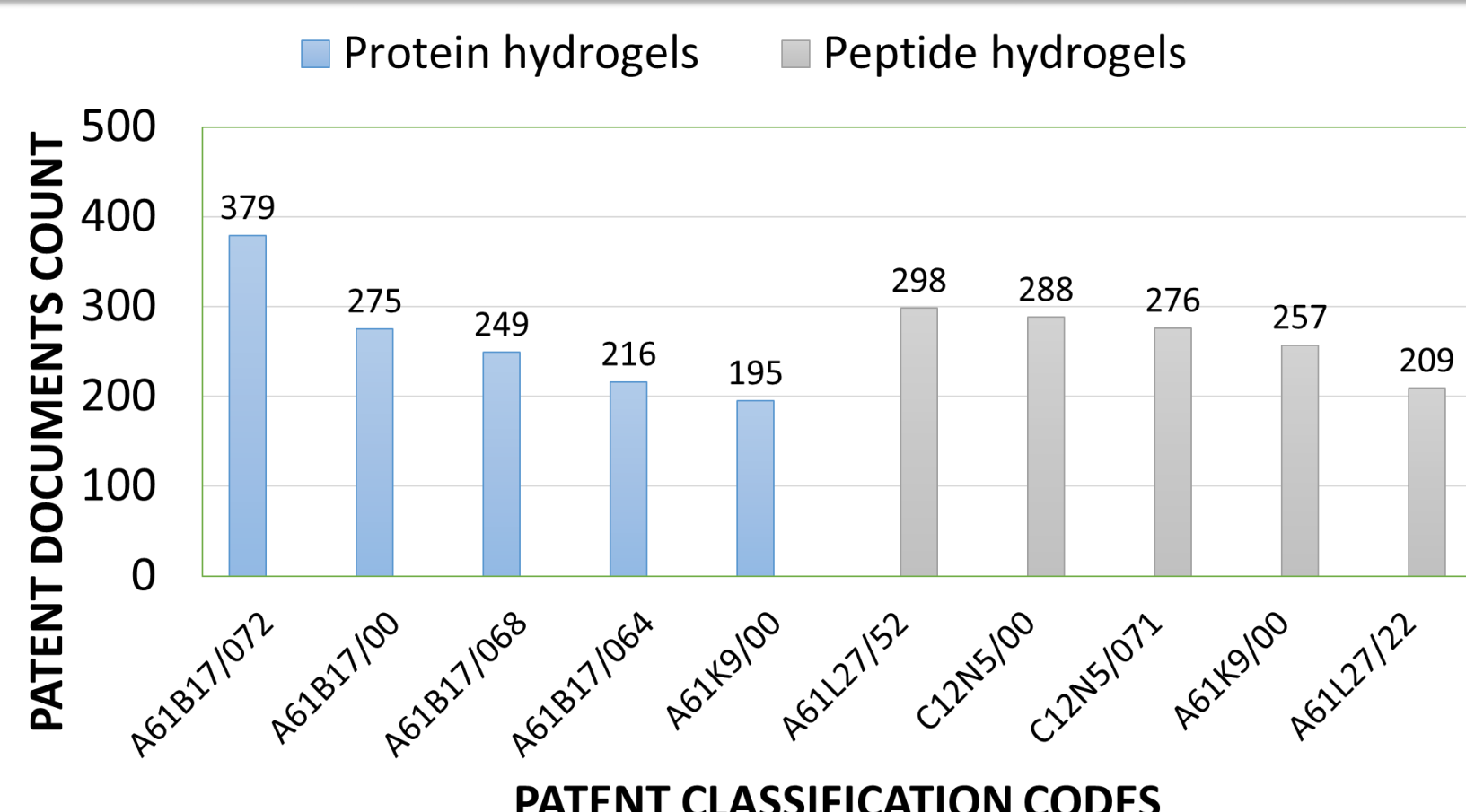
AIM

- ❖ By examining patent data, researchers can identify white spaces and gain inspiration for novel solutions that address evolving hydrogel challenges.
- ❖ In this study, a patent analysis has been carried out to highlight the distribution of patent filings and technologies involved hydrogels. A comparison of data between peptide and protein hydrogels was then realized.

METHOD

- ❖ Different patent databases have been utilized.
- ❖ According to titles, abstracts, and claims, searches have been carried out using different keyword related to "peptide and protein hydrogels".

RESULTS & DISCUSSION



Document Types

- Peptide hydrogels have 2,608 patent documents, compared to 2,326 for protein hydrogels.

Publication Trends

- Protein hydrogels have patents dating back to 1936, indicating a longer history, while peptide hydrogels begin in 1998, which aligns with advances in tissue engineering and regenerative medicine.

Patent Classifications

- **Protein Hydrogels:** Top classifications are within the A61B and A61K series, focusing on medical and pharmaceutical applications.
- **Peptide Hydrogels:** Top IPC codes vary, with classes A61L and C12N, which relate to medical devices and biotechnological applications, suggesting a focus on biocompatibility and bioengineering.

Jurisdictions

- The U.S. is the dominant jurisdiction for both types of hydrogels, with protein hydrogels recording 1,428 patents and peptide hydrogels 1,583. Peptide hydrogels have more patents filed through the international system PCT (596) compared to protein hydrogels (457), indicating a slightly wider international interest in peptides. Europe and China also play significant roles but with fewer filings.

CONCLUSION

- ❖ Peptide hydrogels represent an emerging field with strong international growth and diverse applications, particularly in bioengineering, while protein hydrogels remain a well-established area with concentrated activity in traditional biomedical domains.
- ❖ This patent analysis underscores how innovation in hydrogel technologies is driven by both historical development and cutting-edge advancements, shaping the future of biomedical materials.

REFERENCES

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