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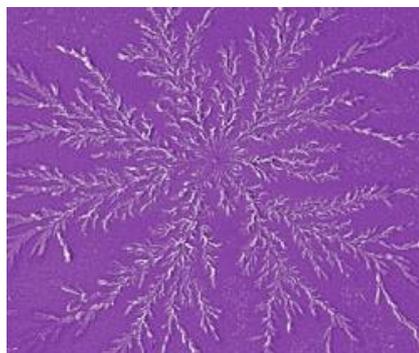


Pretty peptide patterns

20 November 2009

Researchers in Hong Kong have used the smallest building blocks to date to make fractal patterns.

Structures that are built up of similar, repeated smaller units are known as fractals. There are many examples in nature, such as snowflakes, crystals and bacterial colony formation. Scientists seek to recreate these structures to gain further understanding of these natural phenomena.



Small dipeptide nanorods form attractive fractal patterns

Peptides are commonly used as a building block for fractals, but until now only relatively large polypeptides, consisting of at least 15 amino acids, have been used. Ying Chau and Weiping Wang of the Hong Kong University of Science and Technology, Kowloon, have demonstrated fractal formation using simple dipeptides - finding the shortest biomolecules known to form fractals.

Wang and Chau allowed the dipeptides to self assemble into nanorods of as little as 1 micrometre length in solution. The nanorods then self-assembled into fractal patterns. By studying the mechanism of the fractal formation, the pair discovered that the best building blocks for fractals are short rigid nanorods less than 10 micrometres in length.

'We are the first ones to be very explicit about what the basic units are and we give out the dimensions that are required,' explains Chau, 'We have also done some complementary studies using long nanofibres and they were not able to form nice fractal patterns.'

This work provides insight into fractal formation at a mechanistic level and should aid future research into this field, says Chau. Ian Hamley, an expert in soft materials at the University of Reading, points out that there is room for further work, such as investigating why the peptides form nanorods with finite length.

Wang and Chau agree that additional work is needed to answer these questions and they also plan to investigate the potential electronic properties that the aromatic groups within in their fractals may contribute.

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References

W. Wang and Y. Chau, *Soft Matter*, 2009, DOI: 10.1039/b919782f

Link to journal article

Self-assembled peptide nanorods as building blocks of fractal patterns

Weiping Wang and Ying Chau, *Soft Matter*, 2009

DOI: 10.1039/b919782f

