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Behaviour and Strength of Collagen Materials

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Collagen is the main structural component of many natural materials including leather and surgical scaffold materials derived from skin, and heart valve leaflets derived from pericardium. Strength is one of the key characteristics required for the application of these materials however the basis for strength in these materials is not fully understood. We have used small angle X-ray scattering in combination with electron microscopy and atomic force microscopy to study the collagen structure in materials and better understand the behaviour of collagen fibrils during stress. Leather, pericardium and surgical scaffold materials were investigated, and a relationship was uncovered between material strength and collagen fibril orientation, fibril diameter and d-spacing. While there is still many unanswered questions, we are making progress on understanding the relationship between collagen structure and material strength in collagen based materials. This information could be used to optimize these natural materials for application and assist in the development of synthetic analogues of these natural tissues.

Keywords or phrases (comma separated)

Collagen, strength, SAXS, structure

Are you a student?

No

Do you wish to take part in the Student Poster Slam?

Yes

Are you an ECR? (<5 yrs since PhD/Masters)

Yes

What is your gender?

Female

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