distributed along the length of the fibre and is most different where the fibres are clamped for stretching. Because the strain is non-uniform, the reflected colour will be also. In addition, if there is any slippage between the bilayers as the fibre is strained, there will be non-uniform colour in random areas. For the second issue, having a circular rather than an elliptical cross-section results in a larger gradient in colour variation. This could be overcome by starting the rolling process with a rod that has an elliptical or rectangular cross-section. For the third concern, the rolling of bilayers around a glass-rod template is cumbersome, and the rod must later be removed to obtain tunable colour. This might be addressed by pre-straining the bottom layer in the bilayer such that the released strain would result in self-rolling with the appropriate inner diameter.

Overall, however, the versatility of Kolle and collleagues' fabrication approach bodes well for a range of future applications. For example, if insulator–metal bilayers can be rolled, and if the free-standing metal layer were to contain nanoscale patterns[4], then fibre metamaterials could be formed. Such fibres could increase speeds for telecommunications and sensing. In addition, the authors' technique could be used to make multilayer claddings out of many more combinations of materials than those limited by standard fibre drawing, which can be done only at high temperatures[5]. The room-temperature processing of the soft fibres is a distinct advantage. Finally, these flexible colour fibres could be woven into garments used for camouflage by subjecting them to external stimuli such as strain or volatile solvents. The re-engineering of nature's resources for photonic materials with enhanced capabilities has never looked more fruitful. ■

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BIOCHEMISTRY

Sirtuin on a high-fat diet

It emerges that the sirtuin enzyme SIRT6 preferentially removes long-chain fatty-acyl, rather than acetyl, protein modifications. This activity regulates secretion of the inflammation-associated protein TNF-α. SEE LETTER P.110

POONAM BHEDA & CYNTHIA WOLBERGER

Sirtuins regulate a broad range of processes, including transcription, metabolism, fat mobilization, neurodegeneration and ageing. The various functions of these proteins have been largely ascribed to their ability to catalyse the removal of acetyl groups from the lysine amino-acid residues of other proteins through their deacetylase activity. Yet the exact biological action of sirtuins remains unclear. For instance, one sirtuin, SIRT6, which has been implicated in genome stability, inflammation, cancer-cell metabolism and even lifespan, is a very weak deacetylase[1]. On page 110 of this issue, Jiang *et al.*[2] report the surprising discovery that SIRT6 robustly removes a myristoyl group — a long-chain fatty-acyl group — from lysine residues, and that this biochemical activity enables the enzyme to regulate the secretion of TNF-α, a cytokine protein released from cells during inflammation.

Proteins undergo a diverse array of chemical modifications that modulate their activity. The enzymes that add and remove these modifications are therefore key decision-makers in signalling cascades. The lysine side chains of proteins can be modifed by attachment of a small acyl group called acetyl, which is one of the most common regulatory modifications and is best known for its role in controlling transcription. Other, larger acyl modifications of lysine residues have been detected, although their biological roles are largely unknown.

Most sirtuins deacetylate lysine side chains in a reaction that consumes the cofactor nicotinamide adenine dinucleotide (NAD^+), releasing nicotinamide and transferring the acetyl group from the lysine to the remaining ADP-ribose moiety of NAD^+ to form *O*-acetyl ADP-ribose (Fig. 1). Most of the seven human sirtuins (SIRT1–7) exhibit this typical activity, although some, including SIRT6, have either weak or no deacetylase activity. For instance, SIRT5 preferentially binds to and removes succinyl and malonyl modifications from lysine[3]. These acyl groups are larger than acetyls and, unlike them, are negatively charged, but they are linked to lysine by the

50 Years Ago

It is surprising to find that despite the widespread attention directed to the United Nations conference last February on the application of science and technology for the benefit of the less-developed areas, the admirable issue "World of Opportunity" of the *New Scientist* of February 14 still appears to remain the only one in which that conference has been at all adequately handled by British periodicals. This comparative neglect, in spite of copious literature distributed by the Department of Scientific and Industrial Research, in no way detracts from the excellence of the issue of the *New Scientist* which is as welcome for its enterprise as for its intrinsic and timely merit.
From *Nature* 6 April 1963

100 Years Ago

Disastrous floods have followed the severe windstorms in the United States on March 23. The areas chiefly affected are the middle western States … Immense tracts of country have been submerged, and many large towns have become flooded. Much of the ground is below the flood level of the rivers, and in parts the embankments have given way, whilst many tributary rivers have overflowed their banks. Dayton, Indianapolis, Columbus, and numerous other smaller towns have suffered immensely during the last week of March and much loss of life has occurred. Hundreds of houses have been washed away, and immense suffering has been caused … The rivers are said to be still rising in many places, and the full result of the disaster will depend largely upon the weather for the next week or two.
From *Nature* 3 April 1913