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Edible biological materials

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New kind of biological materials which are derived from chemically modified natural substances such as proteins, carbohydrates, lipids and nucleic acids will be addressed. The properties of these materials are under chemical control and they can be tuned to suit the needs of a specific application. There is an urgent need for such bio-derived materials which are also biodegradable when discarded after their useful life span without accumulation in the environment. One driving factor for this area of research has been the concern regarding the extensive accumulation of non-biodegradable materials in our environment which needs urgent attention. This talk will focus on several approaches to address this important problem. Our hypothesis is that bio-derived materials that are fully functional but can be readily degraded into their constituent components where these components can be safely consumed by bacteria, fungi, plants or animals is possible. The properties of such biological materials can be rationally programmed to degrade when exposed to the environmental conditions over pre-determined time scales without generating toxic waste. Some examples with recent advances in understanding their function will be provided.

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