Parker-Gentry Award to Uma Ramakrishnan

'*To conquer our niche, we need to understand the consequences of the assets we enjoy*.'

Uma Ramakrishnan, who has made great strides towards understanding the evolutionary significance of tigers, is the first Indian to receive the Parker-Gentry Award. The 2016 award acknowledges her outstanding achievements in conservation ecology.

Uma Ramakrishnan is a molecular ecologist in the National Centre for Biological Sciences. Her research focuses on two aspects: conservation genomics and landscape genetics. She studies the population genetics of tigers using DNA sequences and trends in genetic variation. She is assessing the distribution, abundance and demographic ratios of tigers at the Bandipur National Park, Karnataka, India. She is passionate about the need for tiger conservation in India, as it not only harbours the majority of the tiger population in the world, but it also has maximum genetic variation and, hence, maximum evolutionary potential. In her words, 'tigers are very charismatic, and I think we all agree we cannot afford to let them go extinct'.

According to Ramakrishnan, 'there has been a loss in connectivity between tiger populations in the last 200 years'. She highlighted anthropogenic activities, like urbanization and poaching, as major setbacks for the stabilization of the tiger population. Loss of connectivity and fragmentation of habitats result in resource limitation and unavailability of mates thus compelling inbreeding. This leads to reduced viability. What we need, according to her, is a global integrative approach to confront tiger conservation, instead of local or population level approaches.

Currently, she is developing genomic techniques for testing faecal samples and the opportunity to sequence the whole genomes of extinct species from fossils. Her goals are to develop methods with the ability to generate genomic data from degraded DNA in tiger faeces, and a portable sequencer which could provide genetic data from tiny samples.

The Parker-Gentry Award to Uma Ramakrishnan prompts us to consider amendments to our policies and to provide some room for the conservation of indigenous mammals, which would otherwise be lost forever.

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RESEARCH NEWS

Cool ways to deliver curcumin: practical nutraceutical

Sarah Iqbal

'*The doctor of the future will no longer treat the human frame with drugs, but rather will cure and prevent disease with nutrition*'.

– Thomas Edison

Turmeric roots were originally used as a dye. No one knows what prompted its use in traditional medicine but it has been a vital part of Ayurveda and Chinese medicine since the past 5000 years. Currently turmeric is widely used in Indian cuisine and as a component of cosmetics and food additives[1].

About two centuries ago, Vogel and Pelletier isolated and purified curcumin, the bright yellow pigment isolated from turmeric[2]. A large part of turmeric's healing properties are from curcumin. So scientists have never stopped investigating it since.

In 1949, curcumin was shown to have antibacterial effects[3]. Suddenly, curcumin took the scientific world by storm. By June 2011, there were more than 4000 articles in the National Institutes of Health about this medical wonder. You could throw anything at it: cancer, tuberculosis, injury, burns, etc. and it would be taken care of. In fact, there is not a single cancer cell line that does not succumb to curcumin in a petri dish.

But '*in vivo*', the story was different. Curcumin could not deliver even half of its promise when administered in animals. Most studies never made it past animal trials. As a result, there is not sufficient data to back the gratifying *in vitro* claims of curcumin in humans. Research reveals that though the molecule is active within the body, the problem maybe more fundamental: curcumin is insoluble in water and has a serum half life of 40–45 minutes. So the availability in the system is too little and for too short a time to replicate its touted effects[1,3,4].

Beginning 1960, there have been massive leaps in the field of material science that led to creation of nanomaterials, biocompatible matrices and polymers that can aid drug delivery. Several strategies have emerged: use of drug nanoparticles, conjugation, encapsulation in gels and micelles….[3]

Although several attempts were made to use these strategies, most of them failed[3,4]. Now, three independent groups from India have reported novel strategies for curcumin delivery that can serve to improve its bioavailability[5–8].

Due to its lipophilic nature, curcumin absorbed by the body preferentially interacts with the human serum albumin (HSA) and lipids. So, in theory, conjugation of HSA to curcumin should not alter its biological action. Since HSA is the major transport protein of blood, this could also improve curcumin solubility. Aravind and Krishnan from Thrombosis Research Institute, Sree Chitra Tirunal Institute for Medical Sciences & Technology, Thiruvananthapuram, conjugated HSA to curcumin to study its biological action[5]. They tested the conjugate drug in a mice model with Dalton's lymphoma