

## TTR cardiac amyloidosis: the right time to start clinical diagnosis globally

Cardiac amyloidosis (CA) is caused by the deposition of amyloid fibrils in the myocardium, leading to cardiomyopathy. Both wild type transthyretin (ATTR<sub>wt</sub>) and mutant transthyretin (ATTR<sub>v</sub>) protein can form amyloid fibres to cause CA<sup>1</sup>. Increased heart wall thickness, apical sparing and late gadolinium enhancement provide heightened clinical suspicion of CA<sup>2</sup>. Technetium-labelled imaging scans using bone tracers can non-invasively differentiate CA caused by transthyretin (ATTR) from amyloid light chain (AL) type. Congo red, TTR-specific immunostaining, mass spectrometry on endomyocardial biopsy and genetic analysis, differentiating ATTR<sub>wt</sub> from ATTR<sub>v</sub>, confirm the diagnosis<sup>2,3</sup>.

Global prevalence of heart disease is increasing at a fast rate. Due to overlap of symptoms with other heart diseases, ATTR-CA remains undiagnosed or misdiagnosed. Moreover, ATTR-CA is no longer considered as rare<sup>1,4,5</sup>, but its actual prevalence still remains unknown due to lack of diagnosis, especially from developing countries. Since transthyretin drug development approaches have yielded therapeutics like tafamids for transthyretin-associated cardiac amyloidosis; now is the right time to make efforts for the clinical diagnosis of TTR amyloidosis. This needs a collective effort from clinicians, cardiologists, pathologists, radiologists, amyloid researchers, cardiac patients and funding agencies. Initially, this task can be taken

in a research mode by cardiologists and amyloid researchers. The preliminary data generated from this initiative will provide rough estimates of patients in different countries of the world and will make a strong foundation for more elaborate studies. Conferences, workshops and public outreach programmes should be conducted for ATTR-CA diagnosis and treatment. More number of patients may also bring down the cost of medicines for its treatment.

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## Antimicrobial activity of piggy-waste medicinal maggots – ‘waste to wealth’ approach towards developing natural therapeutics

Piggery sector in India is a significant source of income for the rural population and nearly 80% of the tribal population in North East India is involved in pig rearing on a small/marginal scale under semi-intensive system of management. Nearly 65% of the total pig population in the country exists in NE India. Piggery sector is the main occupation for sustainable livelihood-cum-nutritional security of socially weaker sections, especially in

NE India. Pig excreta is considered to be a rich source of organic waste, which is an ideal nutrient for flies to lay eggs. Compounds like volatile fatty acids (VFAs), indoles, phenols, ammonia, volatile amines and volatile sulphur are present in pig excreta giving it a unique smell. Once the flies lay eggs on pig excreta, the eggs hatch producing larvae (maggots) and later new flies. During their lifecycle, maggots can survive on

microbial-rich organic waste of pig excreta which suggests their antimicrobial property.

The maggot hemolymphs play many important roles in physiology, such as transporting nutrients and hormones to cells and tissues, maintaining the correct moisture ratio and optimal body temperature, and protecting the maggots from pathogens by means of several innate immunity markers against the

## CORRESPONDENCE

microbial-rich environment in pig excreta. Thus, the medicinal maggots surviving in pig excreta could be an alternative cheap, cost-effective and eco-friendly source to synthetic antibiotics. Presently, scientists are concerned about antimicrobial resistance (AMR) which is a major threat to the present-day antibiotics. Identification of maggot hemolymphs-derived antimicrobial activity will pave the way for the generation of a cheap, cost-effective and eco-friendly source of antibiotics.

In the present study, isolated hemolymphs from different types of piggery –

waste maggots were subjected to antimicrobial sensitivity testing. Results revealed that tailed maggot hemolymph can develop a clear zone of inhibition against *Salmonella typhimurium* (14 mm length) and *Escherichia coli* (18 mm length), providing evidence for their antimicrobial activity. To the best of our knowledge, there are no earlier reports on the antibacterial activity of hemolymphs of medicinal maggots surviving in pig excreta. Hence an Indian patent has been filed (application no. 202011052348).

Thus the results of the present study suggest that medicinal maggots surviving

in pig excreta show antimicrobial activity and can be exploited for commercial use as an alternate to synthetic antibiotics.

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## NEWS

### Prof. C. N. R. Rao receives the Eni International Award for Research in Energy Frontiers

Eni, a global energy company, has announced the names of the winning researchers and scientists at the 13th edition of Eni Award. The award aims to promote better use of energy sources and encourage new generations of researchers in their work. It bears witness to the importance that Eni places on scientific research and innovation. This is considered to be the Nobel Prize in Energy Research.

The *Energy Frontiers* award, for research into renewable energy sources and energy storage, was awarded to Chintamani Nagesa Ramachandra Rao, from

the International Centre for Materials Science, Bangalore, for his work on metal oxides, carbon nanotubes and other materials, as well as on two-dimensional systems, including graphene, boron-nitrogen-carbon hybrid materials and molybdenum sulfide (molybdenite – MoS<sub>2</sub>) for energy applications and green hydrogen production. The latter can, in fact, be achieved through various processes including the photodissociation of water, thermal dissociation and electrolysis activated by electricity produced from solar or wind energy. Professor Rao has worked in all three areas and deve-

loped some highly innovative materials. These materials are shown to be well suited for energy storage systems, of importance in renewable energy sector.

The Eni Awards 2020 (www.eni.com) will be presented on 14 October 2021 during an official ceremony to be held at the Quirinal Palace in Rome, and attended by the President of the Italian Republic, Sergio Mattarella. The Energy Frontiers award includes a cash prize and a specially minted gold medal.

Rao is Linus Pauling Research Professor and Honorary President at the Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bengaluru, India and is the Director of ICMS. Over the decades, he has immensely contributed to several areas of research, developing and investigating novel functional materials and nanomaterials such as fullerenes, graphene and 2-D inorganic solids, diverse forms of transition metal oxides with interesting magnetic and electronic properties, phenomena such as superconductivity and colossal magneto resistance in rare-earth cuprates and manganates, and so on. Rao has authored over 1770 research papers, which have attracted a huge number of citations, crossing 125 thousand till date, with a high H-index of 160. He has authored 53 books. He has received honoris causa doctorate degrees from 83 Universities.



C. N. R. Rao