



ADAPTATIONS AUX MILIEUX POLAIRES ET BIOMIMÉTISME

QUAND LES RÉGIONS POLAIRES INSPIRENT

L'INNOVATION



4<sup>e</sup> COLLOQUE EN FRANCE

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## BIOMIMETICS - AN APPROACH TO FIND NOVEL TREATMENT STRATEGIES FOR HUMAN DISEASE

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Many of the >2 million animal species that inhabit earth have developed survival mechanisms that aid in the prevention of obesity, kidney disease, starvation, dehydration and vascular ageing; however, some animals remain susceptible to these complications. Muscle loss, osteoporosis and vascular disease are common in subjects with reduced renal function. Despite intensive research of the underlying risk factors and mechanisms driving these phenotypes, we still lack effective treatment strategies for this unfortunate patient group.

Thus, new approaches are needed to identify effective treatments. We believe that nephrologists could learn much from biomimicry; i.e. studies of nature's models to solve complicated physiological problems and then imitate these fascinating solutions to develop novel interventions. The hibernating bear (*Ursidae*) should be of specific interest to the nephrologist as they ingest no food or water for months, remaining anuric and immobile, only to awaken with low blood urea nitrogen levels, healthy lean body mass, strong bones and without evidence for thrombotic complications. Identifying the mechanisms by which bears prevent the development of azotemia, sarcopenia, osteoporosis and atherosclerosis despite being inactive and anuric could lead to novel interventions for both prevention and treatment of patients with chronic kidney disease.