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# A pathological water model for end stage renal disease

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Life as we know it does not sustain without water ($H_2O$). Because of all biochemical reactivity must take place in water, thermodynamically, if any pathophysiology occurs, water molecule should be the first to response such an event. Prior art, the stable isotopic ratios of hydrogen (d2H) and oxygen (d18O) in human blood plasma of the end stage renal disease (ESRD) patients are shown to deviate from the Normal Renal Function (NRF) subjects as supposedly the biological isotope homeostasis in human blood plasma should be preserved. Here we study the stable isotopic compositions of water from human blood plasma and from human erythrocyte, collected from a total of 53 ESRD patients and of 19 NRF subjects. A pathological water model established by using the ratio of d2H and d18O as a state function of thermodynamic entropy shows a plausible singularity of the ESRD. This entropy singularity describes a characteristic water intricacy of the ESRD. In addition, the waters within the erythrocyte and the blood plasma are distinct about the stable isotopic compositions of hydrogen and oxygen atoms of water molecule. Of the five NRF subjects who exhibit the ESRD's entropy singularity are all common with hyperlipidemia. Our *in vivo* stable isotope water data and the pathological water model indicate that hyperlipidemia is the cause of Chronic Kidney Disease (CKD) and eventually might progress to ESRD. We suggest that people who have hyperlipidemia should not only monitor the cholesterol level but also the stable isotope contents of the body water.

## Biography

Yuan-Hau Lin is a MD, Specialist in Nephrology and is currently a PhD candidate in the College of Medicine at Taipei Medical University. He is the Secretary-General of the Taiwan Society of Nephrology since 2017. He has co-authored one peer review article in PLOS.

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