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# Cryo-EM structural studies of the mammalian mitochondrial respiratory chain



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The oxidative phosphorylation electron transport chain (OXPHOS-ETC) of the inner mitochondrial membrane is made up of five large protein complexes (CI, CII, CIII, CIV and CV). These complexes are responsible for converting energy from the food we eat into ATP, a small molecule that is used throughout the cell to power a multitude of essential reactions. It has been shown that the OXPHOS-ETC complexes are organized into supercomplexes (SCs) of defined stoichiometry. Here I will present my work using cryo-EM to solve the first atomic structure of mammalian mitochondrial CI and the first architecture of the 'respirasome' supercomplex, (SC I+III<sub>2</sub> +IV). Additionally, using a novel preparation of functional SC I+III<sub>2</sub> this structure has now been resolved to 4.0 Å resolution with multiple structural classes. The possible mechanistic implications of these structures will be discussed.

