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## **Physiological and pathological phosphate biominerals: properties and perspectives**

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It is well known, that phosphates comprise about 25% of the biogenic mineral types. The most widely produced phosphate biomineral is hydroxyapatite, which is the most important component of vertebrate bones and teeth. At the same time, different phosphate minerals (brushite, struvite, etc.) could form in tissues of living organisms due to pathological biomineralization. Thus, there is great interest in understanding the physical mechanisms of physiological and pathological mineralization.

It is known, that magnetic resonance spectroscopy is effective method for investigation of biominerals' phase composition, due to its high sensitivity, that allows detecting the impurities in trace amounts. In our laboratory, it was shown, that after the heating of physiological phosphates from bones in the temperature range of 700-900°C, different signals of magnetic multiresonance appear. These signals were attributed to iron-bearing minerals, which formed due to re-crystallisation of initial minerals.

Joint complex investigation of the properties of physiological and pathological phosphate minerals could provide the necessary knowledge for creation of new type of synthetic "bioinspired" nanostructure materials for bone treatment and other medical problems solution.