Biomechanical material properties of the bridging brain veins are investigated experimentally (A Nikon light microscope was used for the histo-anatomical study and viskoelastic properties was measured on a MTS 858.2 Mini Bionix system) and theoretically. The main goal of the developed theory was to formulate the biomechanical conditions (geometrical dimensions, viscoelastic properties of veins and blood fluid flow conditions) at which unstable behavior or even vein collapse can occur.
The study of the geometry and topology of bridging veins was carried out by a magnetic resonance (Siemens Magnetom Symphony1,5 T) and a stereomicroscope (Nikon SMZ 1500) complemented with a digital camera (Nikon Coolpix E995) and Lucia Net software.
From the biomechanical point of view, experimental findings can be summarized as follows:

- the existence of two types of venous brain systems; thin and thick wall veins with a one order difference in elastic modulus magnitude

- high sensitivity of the thin wall veins on the blood flow rate and extension or contraction on their structural stability

- the existence of continuing small wall vibration under physiological conditions

Under small deformations conditions, the shear modulus was shown experimentally to be in the range $(2\div4)\cdot10^{4}$ Pa with a Young modulus $E= (0.6\div1.2)\cdot10^{5}$ Pa. Due to the high hyperelasticity of the vein tissue, the ultimate stress reached a value $2\cdot10^{7}$ Pa and a specific elongation of $\Delta l / l_0 = 0,2556\cdot10^{-3}$.

Provided that the Neo-Hook’s material model was applied, the analytical formula for the collapse conditions was found. It was proved that for a brain vein contraction about 5%, vein collapse can occur even under normal physiological condition into vessels – angiosynizesis.

The numerical simulation of fluid structure interaction in the brain bridging veins the persistent wall vibration was discovered. These vibrations are observed *in vivo* too

The four kinds of outflow modifications of the bridging brain veins were discovered; two of them only are mentioned in the literature.

The simultaneous clinics observation (histological findings), in vitro experiments and numerical modeling gives sufficient data to simulate brain metabolism and to predict biomechanical conditions of the angiosynizesis.

Key worlds: bridging vein, angiosynizesis, biomechanical parameters, persistent vein wall vibrations, ultimate stress