

# Ultrasonic system for investigation of blood coagulation process

A co-operative project between Kaunas University of Medicine and Ultrasound Institute

## The objective of the project

Development of the sensitive ultrasonic method suitable for investigation of an entire blood clotting process, starting from the first minute structural changes.

## The necessity to measure

Whole blood coagulation analysis allows to detect clotting deficiencies related to various diseases and to monitor the effect of drugs such as anticoagulants. Multi-channel measurement of the blood coagulation process enables an investigation of the spatial-temporal variations of blood's properties during the coagulation process.

## Ultrasound Institute

Developed method for investigation of an entire blood clotting process and designed multichannel measurement cells for medical applications.

## Principle of blood coagulation monitoring

Principle of monitoring is based on measurements of ultrasound velocity:

- ▶ Measurements are performed on-line in small volumes of blood 0.2 ml;
- ▶ Sensitivity and accuracy of measurements  $\Delta c < 5 \text{ cm/s}$ ;
- ▶ Influence of temperature is eliminated;
- ▶ Experiments were carried out on a few hundreds of volunteers.

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## RELATED INFORMATION

1. **B. Voleišienė, A. Voleišis.** Ultrasound velocity measurements in liquid media. *Ultragarsas*. 2008. Vol. 63. No. 4. P. 7-19. [/pdf/](#)
2. **R. Kažys, A. Voleišis, B. Voleišienė, R. Šlīteris, L. Mažeika, P. Grybauskas.** Ultrasonic multi-channel method for investigation of non-stationary biologic liquids. *Ultragarsas*. 2003. Vol. 49. Nr. 4. P. 53-57. [/pdf/](#)
3. **B. Voleišienė, A. Voleišis, R. Kažys, L. Mažeika, R. Šlīteris.** Dynamic calibration method for ultrasonic coagulometry. *Ultragarsas*. 2002. Vol. 44. No. 3. P. 45-49. [/pdf/](#)
4. **A. Voleišis, R. Kažys, L. Mažeika, R. Šlīteris, B. Voleišienė, P. Grybauskas.** Ultrasonic method for the whole blood coagulation analysis. *Ultrasonics*. 2002. Vol. 40. Issues 1-8. p.101-107. [/pdf/](#)
5. **A. Voleišis, R. Kažys, L. Mažeika, R. Šlīteris, B. Voleišienė.** Ultrasonic method for the whole blood coagulation analysis. Abstract book of conf. "Ultrasonics International 2001". 2-5 July 2001. Delft, The Netherlands. /Elsevier science.
6. **B. Voleišienė, A. Mongirdienė, A. Voleišis, R. Šlīteris.** Reference medium for blood coagulation ultrasonic studies. *Ultragarsas (Ultrasound)*. Kaunas: Technologija. 2000. Vol. 34. No.1. P.20-22. [/pdf/](#)
7. **A.Voleišis, R.Kažys, L.Mažeika, R.Šlīteris, B.Voleišienė.** Ultrasonic technique for the investigation of structural properties of biological fluids. *Acustica-Acta Acustica*. Berlin: EEIG ISSN 1436-7947. Vol. 85. No. 1. 1999. p. 443-444. [/pdf/](#)
8. **P.Grybauskas, R.Kažys, L.Mažeika, R.Grybauskienė, A.Mongirdienė, R.Šlīteris, B.Voleišienė, A.Voleišis.** Issledovanie biologičeskich židkosteju ultrazvukovym koagulografom. *Biofizika*. ISSN: 0006-3509. Vol. 50. No. 3. 2005. p. 550-558.
9. **P.Grybauskas, A.Mongirdienė, R.Kažys, A.Voleišis, R.Šlīteris, L. Mažeika, B.Voleišienė.** Ultrasonic coagulography. *The Scandinavian Journal of Clinical and Laboratory Investigation*. ISSN 0036-5513. Vol. 62. No. 236. 2002. p. 106.
10. **A.Voleišis, R.Kažys, L.Mažeika, R.Šlīteris, B.Voleišienė.** Ultrasonic technique for the investigation of structural properties of biological fluids. *J. Acoust. Soc. Amer.* Melville: American Institute Physics. ISSN 0001-4966. Vol. 105. No. 2. Pt.2, February 1999. p. 1369-1370. [/pdf/](#)
11. **A.Voleišis, R.Šlīteris, B.Voleišienė, R.Kažys, L.Mažeika, V.Cičėnas, P.Grybauskas.** Application of linear ultrasonic array to investigation of non-homogeneous media. *Ultragarsas*. 2005. Vol. 57. No. 4. p. 11-17. [/pdf/](#)
12. **B.Voleišienė, A.Mongirdienė, A.Voleišis, R.Šlīteris.** Reference medium for blood coagulation ultrasonic studies. *Ultragarsas*. 2000. Vol. 34. No. 1. p. 20-22. [/pdf/](#)

