

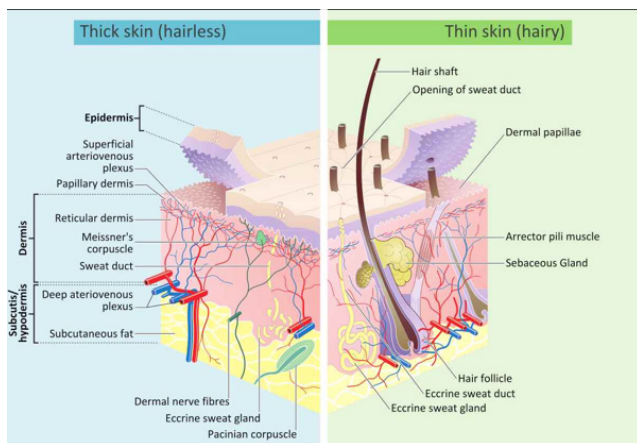
# Diagnosis of Skin Cancer Based on Information and Communication Technologies Tools / SKINMONITOR

## the objective of the project

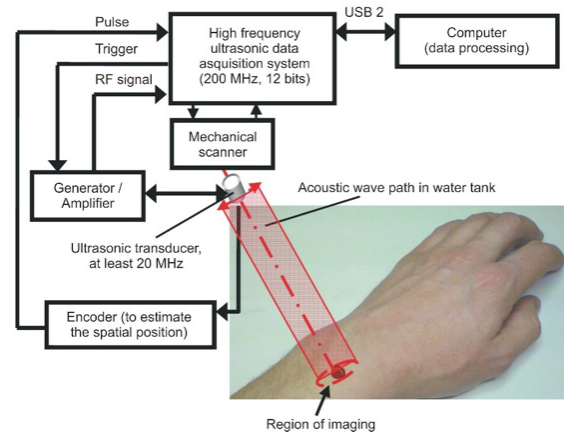
To deliver non-invasive ICT based tool that improves the accuracy of skin cancer diagnosis by analyzing and fusing information from digital optical images and ultrasound data.

## ultrasound institute

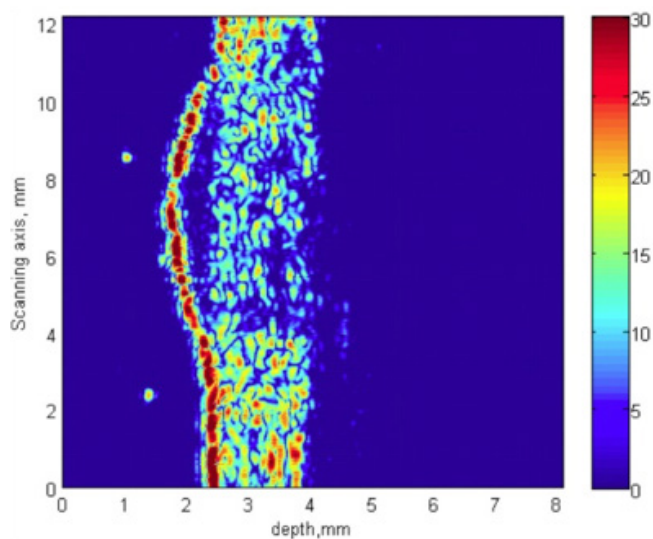
Proposed the concept and the structure of the innovative ultrasonic non-invasive device for diagnostics of human skin cancer and characterization of the skin cancer tissues.



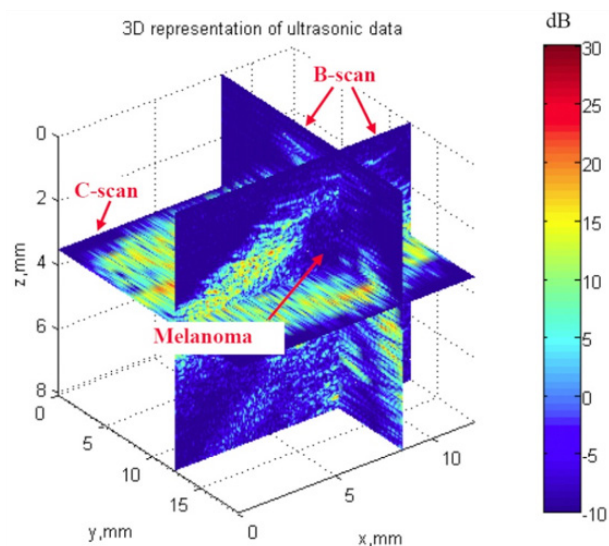
Skin layers ([https://en.wikipedia.org/wiki/Human\\_skin](https://en.wikipedia.org/wiki/Human_skin))



The structure of ultrasonic imaging system for dermatology



The B-scan image of the melanoma



Representation of ultrasonic data (acquired on a phantom) in different slices of 3D volume

Frequency, MHz	Maximum penetration, mm	Axial resolution (1580 m/s / frequency), $\mu\text{m}$
10	35	158
20	10	79
30	6	53
50	4	32
75	3	21
100	1.5	16

The dependence of axial (depth) resolution and penetration depth of the frequency of ultrasonic waves

## related publications

1. R. Raišutis, E. Jasiūnienė, D. Jasaitienė, S. Valiukevičienė. Investigation of human skin using pulse-echo ultrasonic technique: review and development. *Ultragarsas*. 2010. Vol. 65. No. 1. P. 37-41.
2. D. Jasaitienė, S. Valiukevičienė, G. Linkevičiūtė, R. Raišutis, E. Jasiūnienė, R. Kažys. Principles of high-frequency ultrasonography for investigation of skin pathology. *Journal of the European Academy of Dermatology and Venereology*. 2011. Vol. 25. No. 4. p.375-382.
3. K. Andrėkutė, I. Subotinaitė, S. Valiukevičienė, R. Raišutis. Development and investigation of skin melanoma phantoms for ultrasonic examination, *Acta medica Lituanica*, Vilnius, 2013, Vol. 20, No. 2, p. 85-92.
4. V. Kučinskienė, D. Samulėnienė, A. Gineikienė, R. Raišutis, R. Kažys, S. Valiukevičienė. Preoperative assessment of skin tumor thickness and structure using 14-MHz ultrasound // *Medicina / Lithuanian Medical Association, Lithuanian University of Health Sciences and Vilnius University*. Kaunas: LSMU,. 2014, Vol. 50, No. 3, p. 150-155.
5. K. Andrėkutė, S. Valiukevičienė, R. Raisutis, G. Linkevičiūtė, J. Makštienė, R. Kliunkienė. Automated estimation of melanocytic skin tumor thickness by ultrasonic radiofrequency data, *Journal of ultrasound in medicine*. Laurel, MD: American Institute of Ultrasound in Medicine. 2016, Vol. 35, Iss. 5, p. 857-865.