**Table S2. Mechanical properties of human tissues and cells.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Human Tissue | Normal | Tumor | Methods | Ref. |
| Skin | healthy skin:  12.8 ± 5.4 kPa  Normal: 2~3 kPa | Scar:  74.8 ± 26.8 kPa  Melanoma tissue: 25.58 ± 5.96 kPa | High-Frequency Ultrasound Elastography,  Indentation-based mechanical analyzer | [1]  [2] |
| Brain | 10-25 Hz: 0.62 ± 0.08 kPa,  25-35 Hz: 1.56 ± 0.16 kPa,  40-50 Hz: 2.18 ± 0.20 kPa  \*Brain stiffness increases with age. Also regional variations of stiffnesses. | 0.87 - 1.95 kPa (30~60 Hz) | Multi-Frequency Magnetic Resonance Elastography | [3-5] |
| Liver | 0.6-0.7 kPa  4.93 ± 0.83 kPa | Fibrosis: 0.7-1.8 kPa  (Cirrhosis: 13.29 ± 3.27 kPa) | Compression  Two-dimensional shear wave elastography | [6, 7] |
| Colorectal tissue | 0.936 kPa  (0.374-7.33) | 7.51 kPa  (1.08-68.0) | Tactile sensor. | [8] |
| Breast | Normal fibroglandular tissue  3.24+/-0.61 kPa | High-grade invasive ductal carcinoma  42.53+/-12.47 kPa | Indentation technique | [9] |
| Prostate | 15.9 ± 5.9 kPa | 40.4 ± 15.7 kPa | Mechanical device | [10, 11] |

|  |  |  |  |
| --- | --- | --- | --- |
| Cell | Elastic modulus | Methods | Ref. |
| Neuron | 0.03-0.97 kPa | Atomic force microscopy | [5] |
| non-malignant ureter cell (HCV29), urinary bladder carcinoma cell (HT1376) | HCV29: 8.19 ± 0.46 kPa  HT1376: 2.47 ± 0.25 kPa | Atomic force microscopy | [12] |
| Human mesenchymal stem cells (MCSs) | Undifferentiated MSCs: 2.4 ± 0.64 kPa  Osteogenic differentiating MSCs: 12.28 ± 1.85 kPa | Atomic force microscopy | [13] |
| Human melanoma cell | ~0.25 kPa (no FLNA)  ~0.4 kPa (with FLNA) | Magnetic twisting cytometry | [14] |
| Human epithelial cells | 5-18 kPa (normal)  0.7-2.1 kPa (cancerous) | Scanning force microscopy | [15] |

Stiffness can be assessed using different methods, including rheometer, atomic force microscopy (AFM), magnetic resonance elastography, and indentation devices [16]. However, it's essential to consider that the measured stiffness can vary significantly based on the instrument used, the geometrical structure of the specimen, and experimental conditions such as the cantilever geometry for AFM, sample-instrument adhesion, and operator variability. Therefore, when comparing stiffness values from independent studies, caution should be exercised to account for these potential sources of variation [17].

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