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| **Breast Tissue Data Set** *Download*: [Data Folder](https://archive.ics.uci.edu/ml/machine-learning-databases/00192/), [Data Set Description](https://archive.ics.uci.edu/ml/datasets/Breast+Tissue)  **Abstract**: Dataset with electrical impedance measurements of freshly excised tissue samples from the breast. |  |

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| **Data Set Characteristics:** | Multivariate | **Number of Instances:** | 106 | **Area:** | Life |
| **Attribute Characteristics:** | Real | **Number of Attributes:** | 10 | **Date Donated** | 2010-05-10 |
| **Associated Tasks:** | Classification | **Missing Values?** | N/A | **Number of Web Hits:** | 142428 |

**Source:**

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**Data Set Information:**

Impedance measurements were made at the frequencies: 15.625, 31.25, 62.5, 125, 250, 500, 1000 KHz  
Impedance measurements of freshly excised breast tissue were made at the follwoing frequencies: 15.625, 31.25, 62.5, 125, 250, 500, 1000 KHz. These measurements plotted in the (real, -imaginary) plane constitute the impedance spectrum from where the breast tissue features are computed.  
The dataset can be used for predicting the classification of either the original 6 classes or of 4 classes by merging together the fibro-adenoma, mastopathy and glandular classes whose discrimination is not important (they cannot be accurately discriminated anyway).

**Attribute Information:**

I0 Impedivity (ohm) at zero frequency  
PA500 phase angle at 500 KHz  
HFS high-frequency slope of phase angle  
DA impedance distance between spectral ends  
AREA area under spectrum  
A/DA area normalized by DA  
MAX IP maximum of the spectrum  
DR distance between I0 and real part of the maximum frequency point  
P length of the spectral curve  
Class car(carcinoma), fad (fibro-adenoma), mas (mastopathy), gla (glandular), con (connective), adi (adipose). The

**Relevant Papers:**

Jossinet J (1996) Variability of impedivity in normal and pathological breast tissue. Med. & Biol. Eng. & Comput, 34: 346-350.  
Silva JE, Marques de Sá JP, Jossinet J (2000) Classification of Breast Tissue by Electrical Impedance Spectroscopy. Med & Bio Eng & Computing, 38:26-30.