

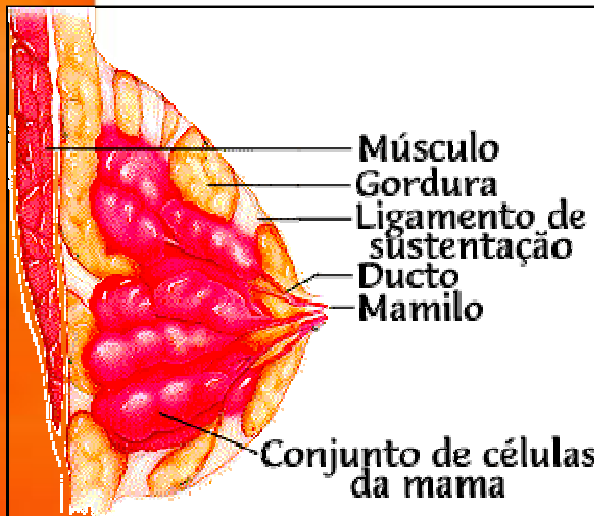
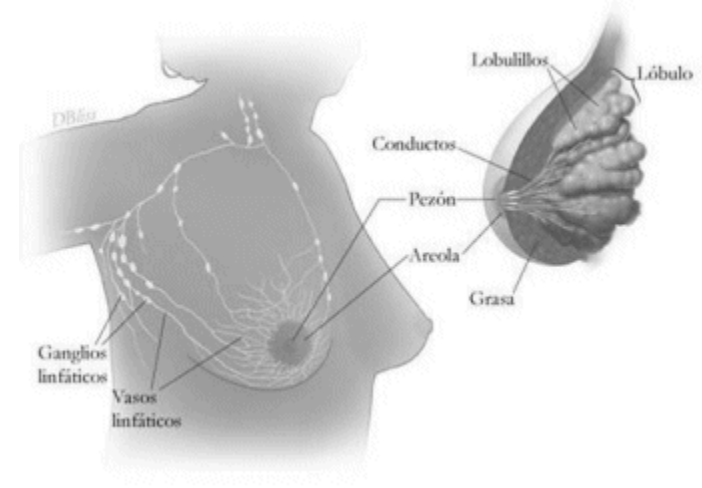
Identificação de tumores dos seios pela análise de suas imagens

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Universidade Federal Fluminense UFF



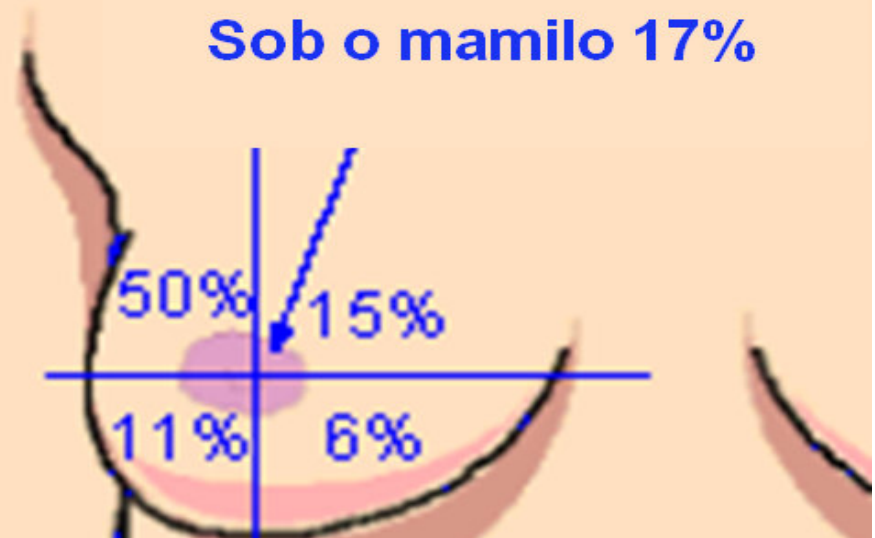
- > Importância
- > Complexidade da estrutura da mama



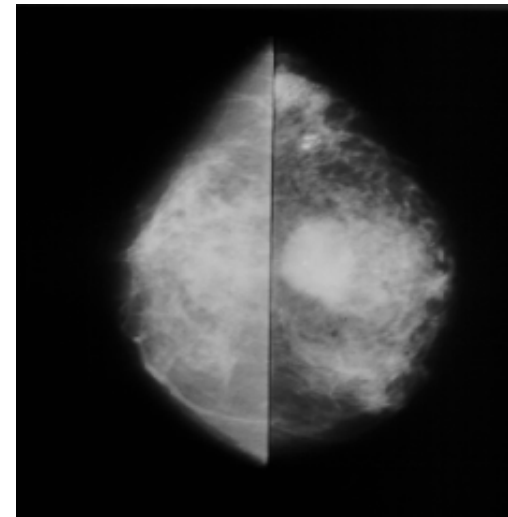
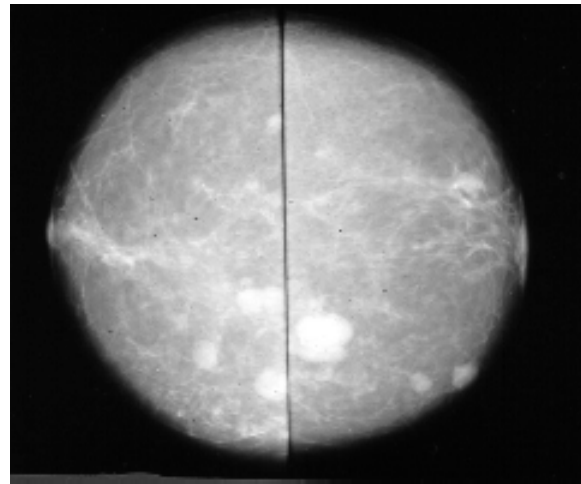
2

Localização do Câncer de Mama nos Quatro Quadrantes

Sob o mamilo 17%



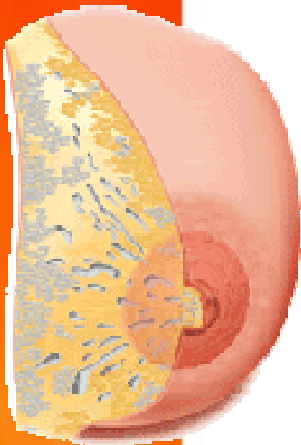
Imagens Reais

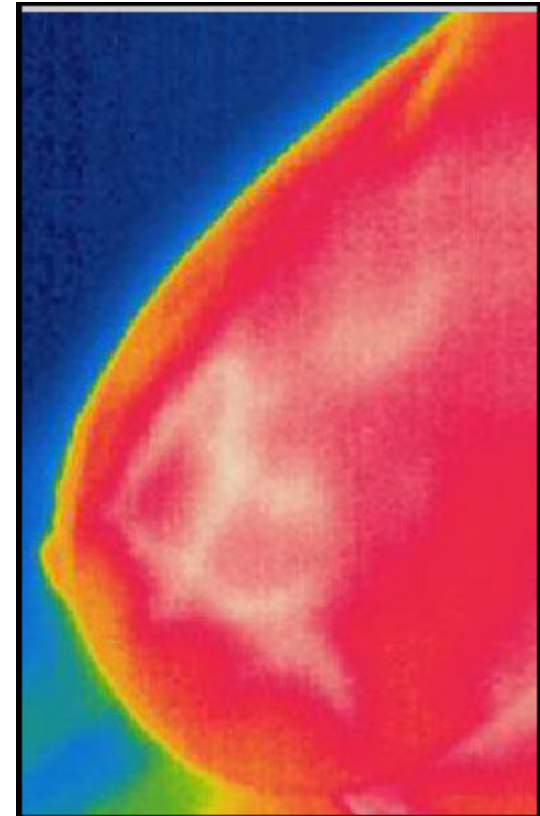


- > Primeiros trabalhos na UFF em 1988
- > Dep. de Radiologia HUAP
- > Banco de imagens resultado de 25 anos de pesquisa da equipe
- > database <http://www.ic.uff.br/~aconci/mam/frameex1.htm>

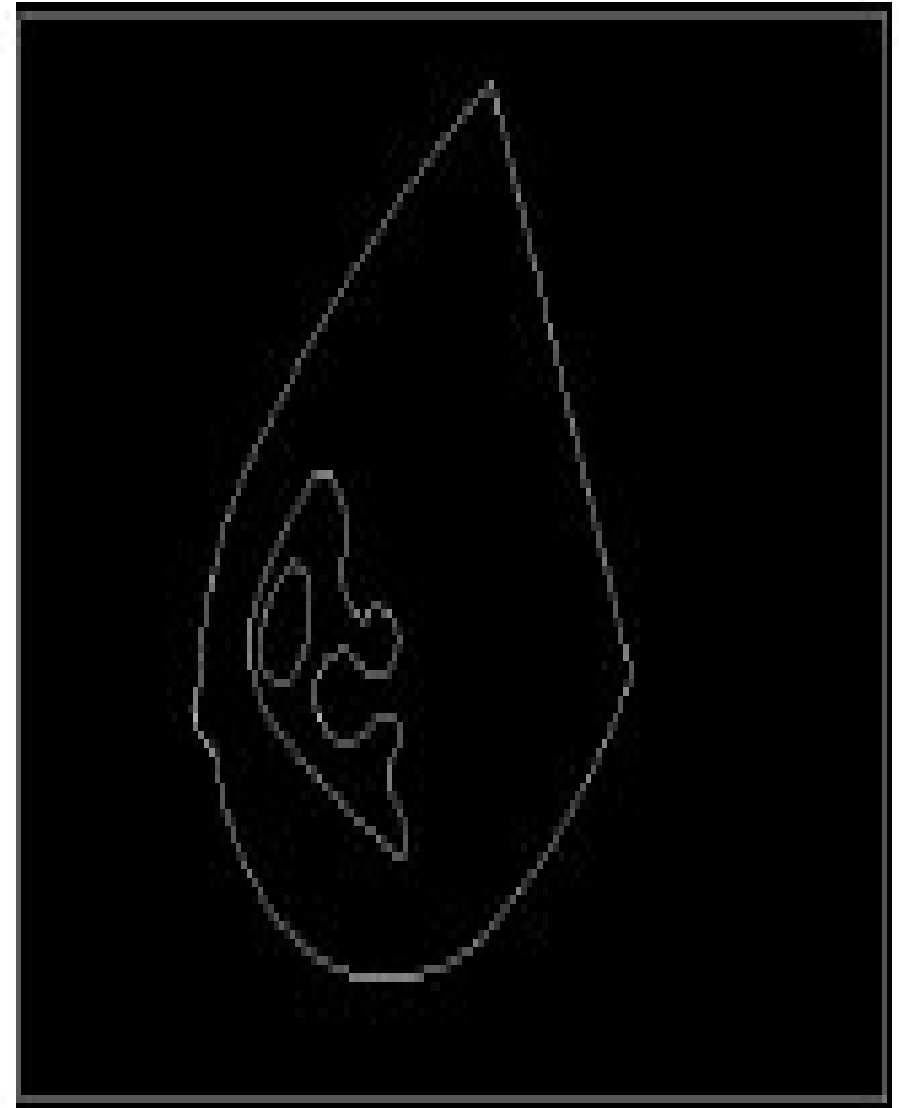
Bases:

- > **Medidas da geometria fractal na identificação de lesões de mamas**
- > **imagens de tomografias**
- > **mamografias :**
 - **termicas,**
 - **convencionais,**
 - **Alta reslução**
- > **Laminas de biosias e exames microscopicos**
- > **DF ; lacunadade e sucolaridade.**
- > **Granulometria x identificação celulas**





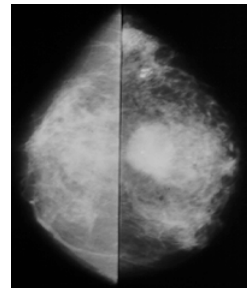
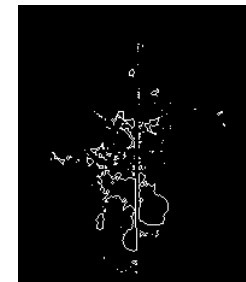
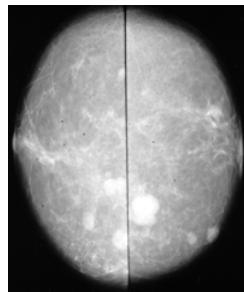
> **Mamograma em baixa resolução, mamograma digital e imagem térmica**



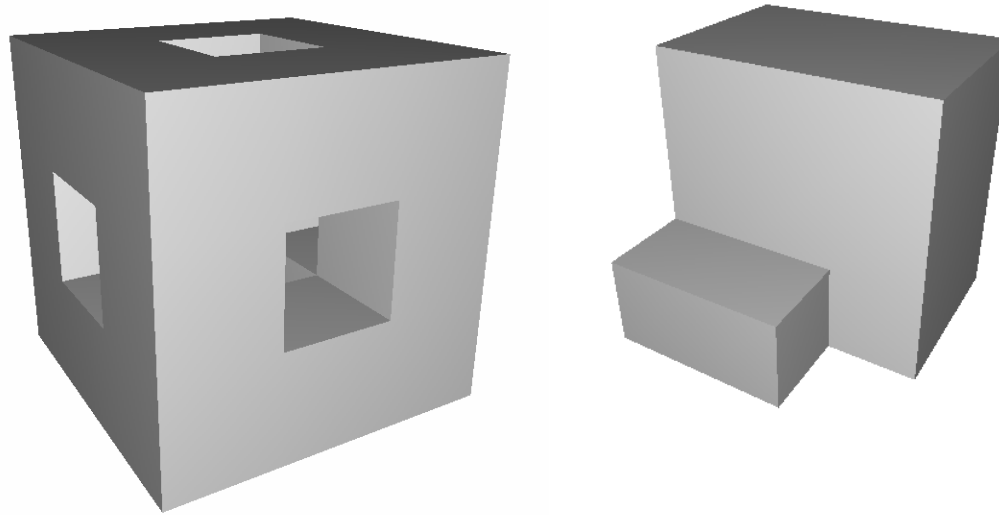
> Segmentações mas
imagens de
mamogramas
térmicos

As imagens de tomografias

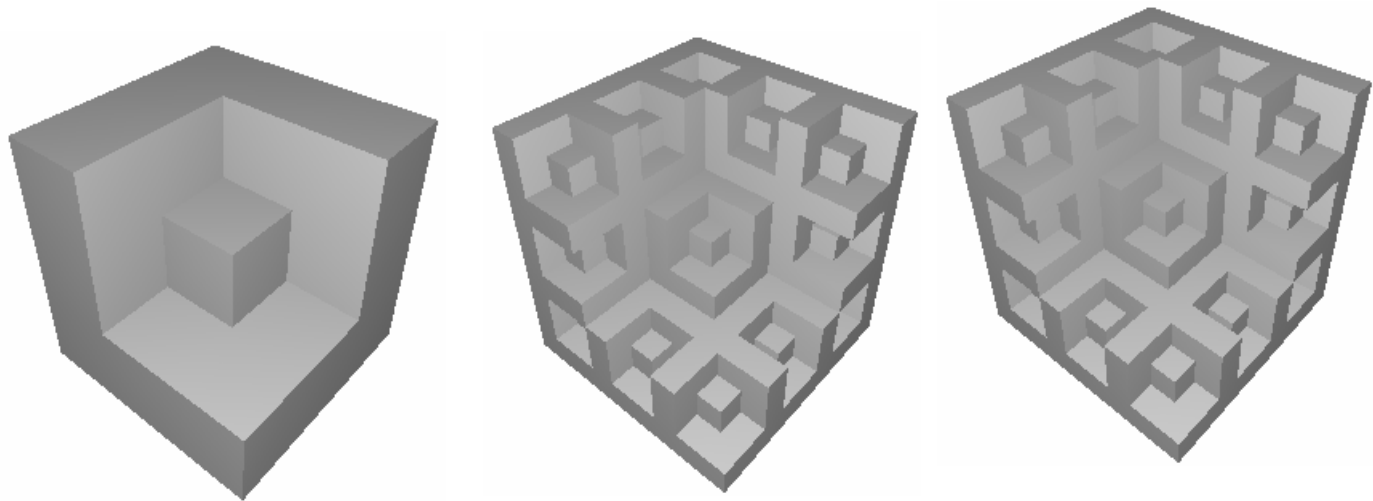
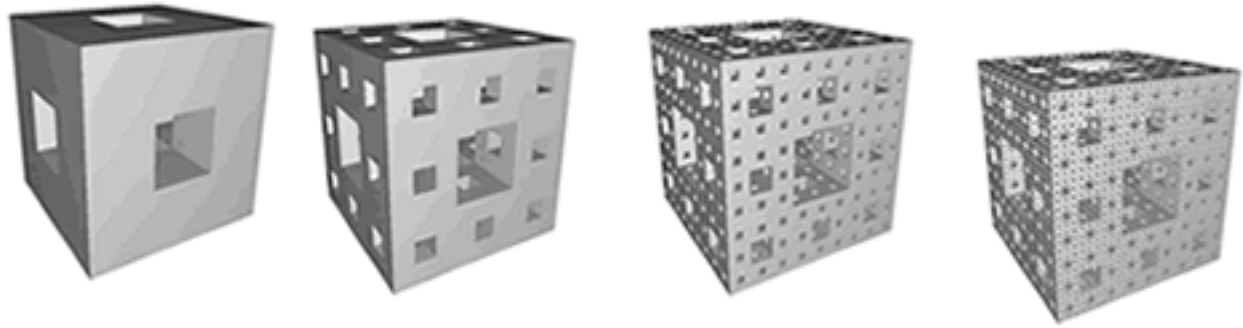
- > Binarização
- > obtenção do contorno.



Medidas da geometria fractal

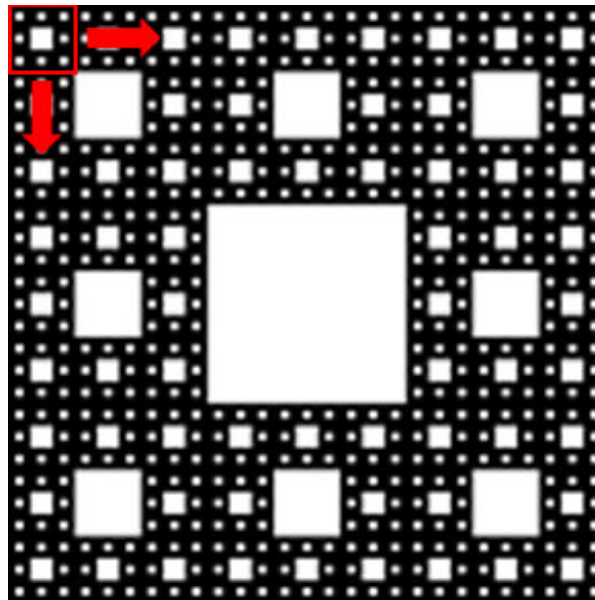


$$\text{FD} \left(\text{cube with hole} \right) = \text{FD} \left(\text{fractal hole} \right) = \frac{\log(20)}{\log(3)} \cong 2,73$$



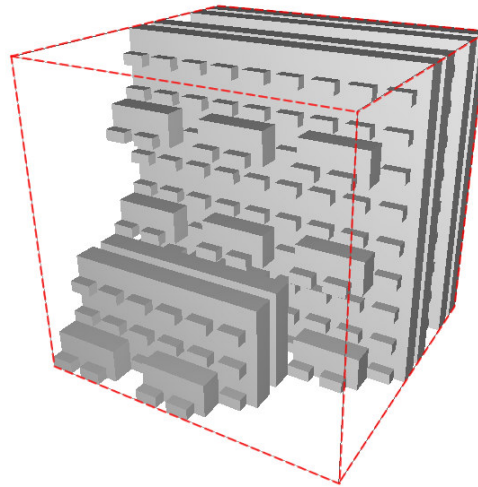
Metodologias Propostas

- > Medida da lacunarity : gliding box algorithm
- > Calculo da distribuição de massa.
- > Posição e densidade.



Proposed approaches

- > Local Lacunarity (LL)
- > axial aligned bounding box (AABB).
- > Lacunarity computed on 2D grey images
voxel can only be considered as empty or full.



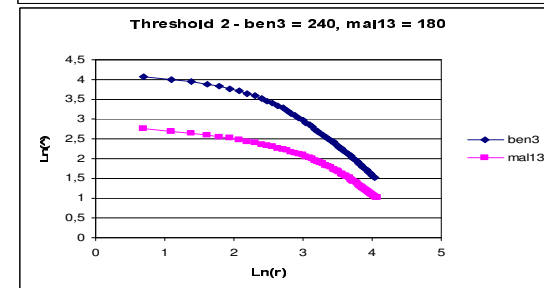
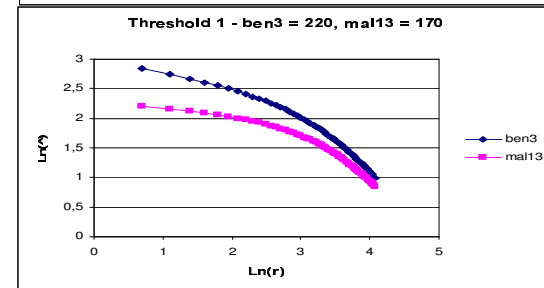
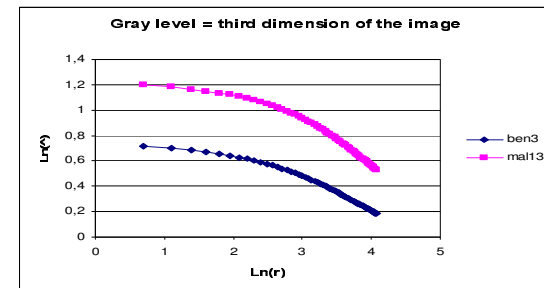
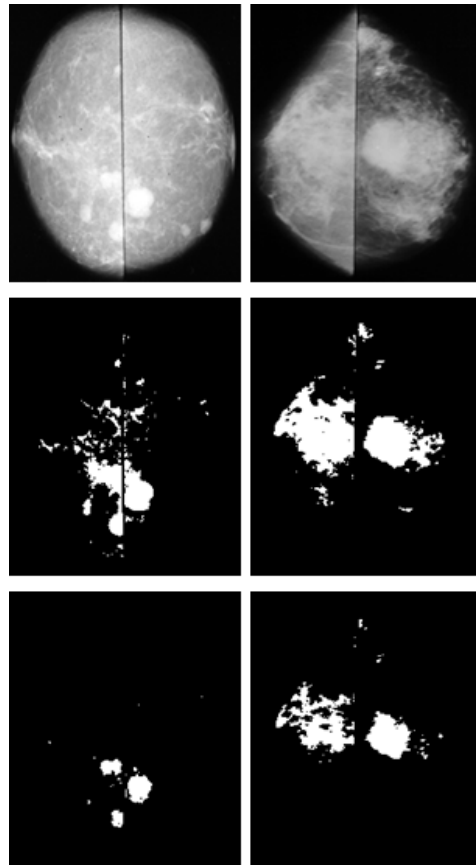
Definição da LL

- > Local Lacunarity (for box side s)

$$\Lambda(s) = \frac{\sum_{i=1}^N M^2 Q(M, s)}{\left(\sum_{i=1}^N M Q(M, s) \right)^2}$$

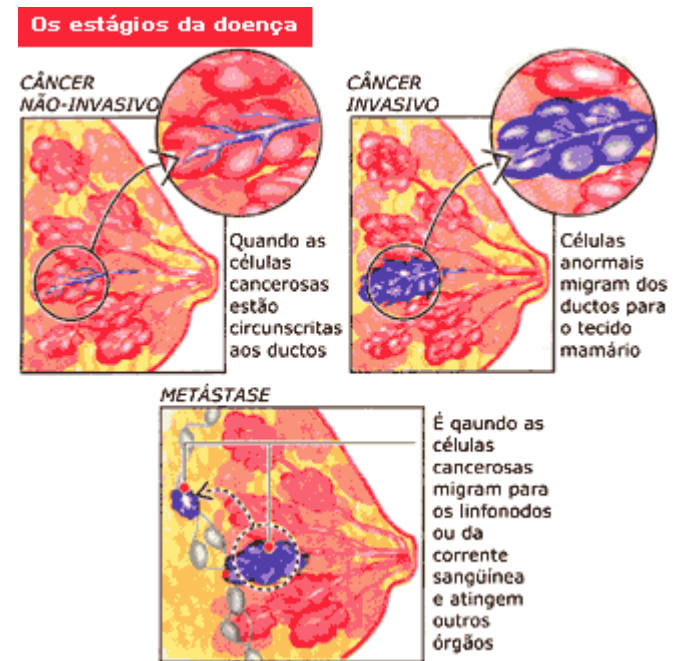
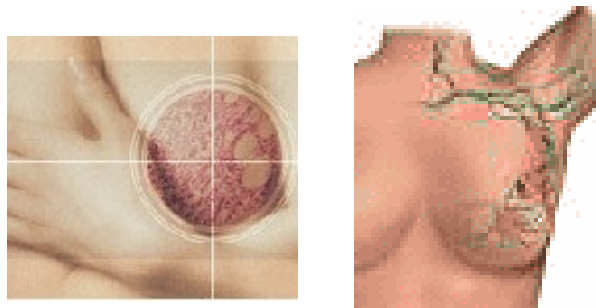
- > Uso da Sucolaridade
- > Descritores de textura e forma

Resultados



Resultados

- > valores de threshold
- > Heurísticas
- > optimal values.
- > imagesresolution
- > lacunarity plots



Classificação contagem de células por imagem

The screenshot displays the Granulometria software interface. The main workspace is divided into four quadrants showing the processing of a microscopic image of cells:

- Top-left:** Original image of cells. A red wavy line at the bottom indicates a threshold of **@ 72%**.
- Top-right:** Image with particles color-coded by size or intensity, labeled **Grãos coloridos**.
- Bottom-left:** Image showing the detected outlines of the particles, labeled **Contorno**.
- Bottom-right:** Image showing the detected ellipses for each particle, labeled **Elipses**.

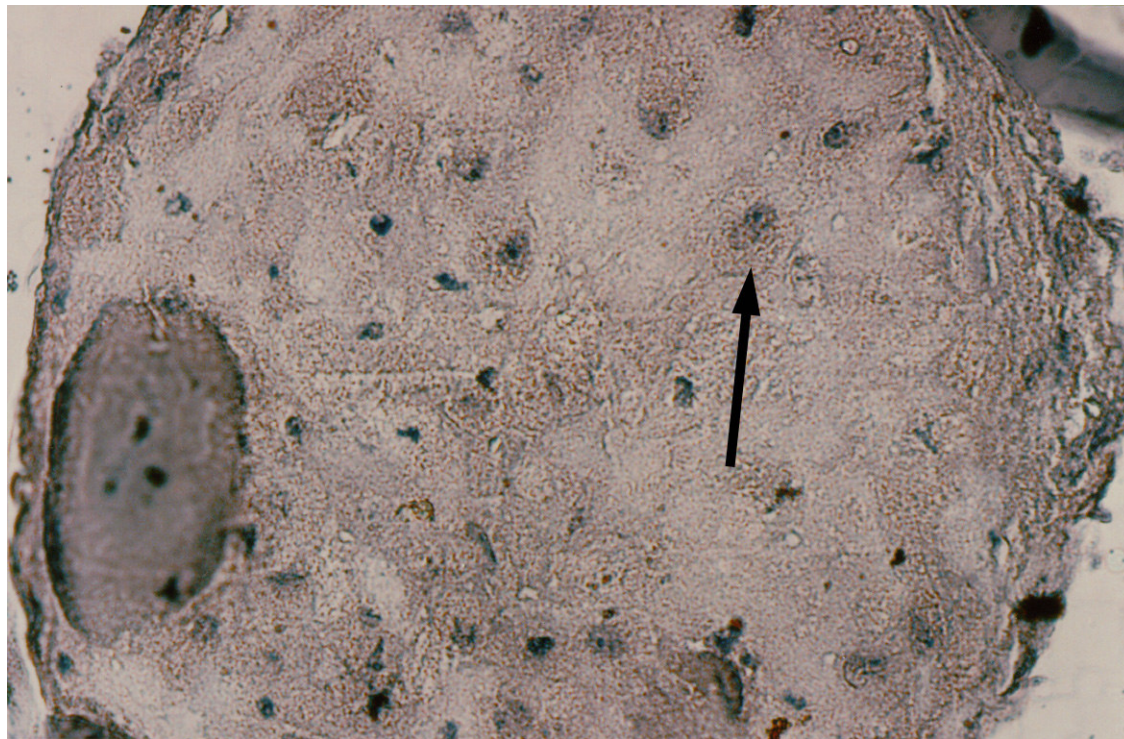
On the right side, a **Projetos abertos** (Open Projects) panel lists several projects:

- Projeto2 [AIDS109]
- Projeto3 [monocyte]
- Projeto4 [pneumocyst]
- Projeto5 [Fundo de pneumocyst]
- Projeto6 [Fundo de monocyte]

The software window title is **Granulometria - [Projeto4]**. The taskbar at the bottom shows the system tray with the time **15:51**.

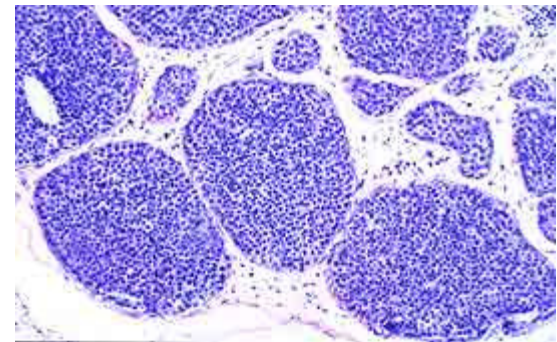
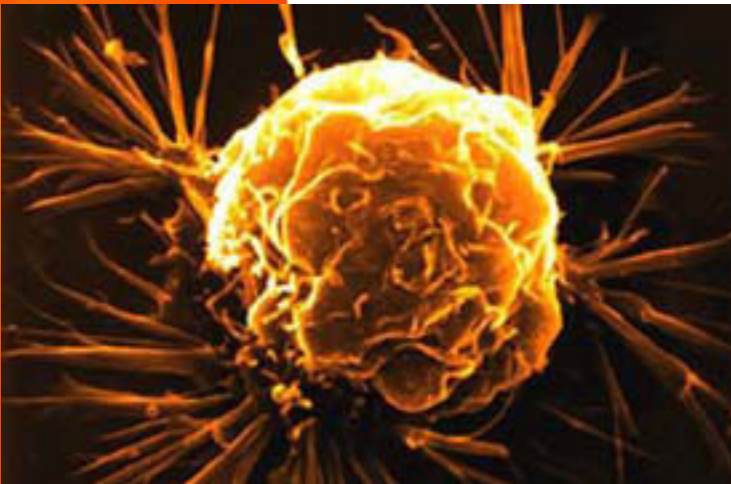
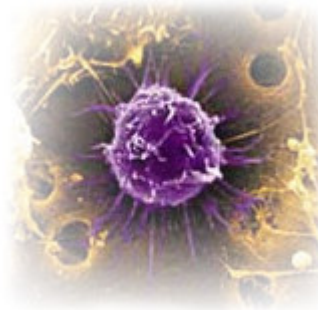
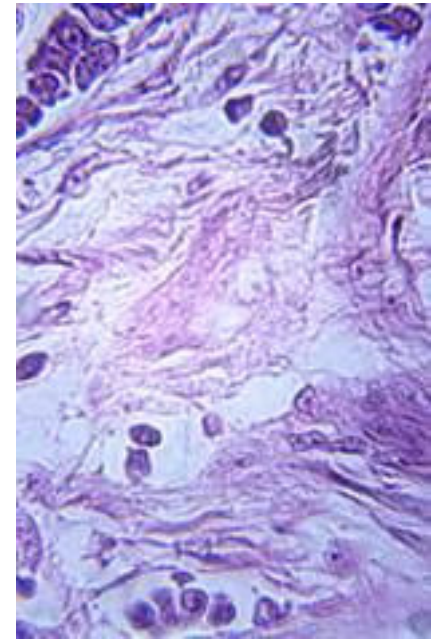
Granulometria = distribuição de partículas por tamanho e tipo

- > **mathematical morphology**
- > **best fitting shapes**



Conclusões

- > Textura em mamogramas
- > exame laminas
- > Image = elemento em 3D



Objetivos Futuros

