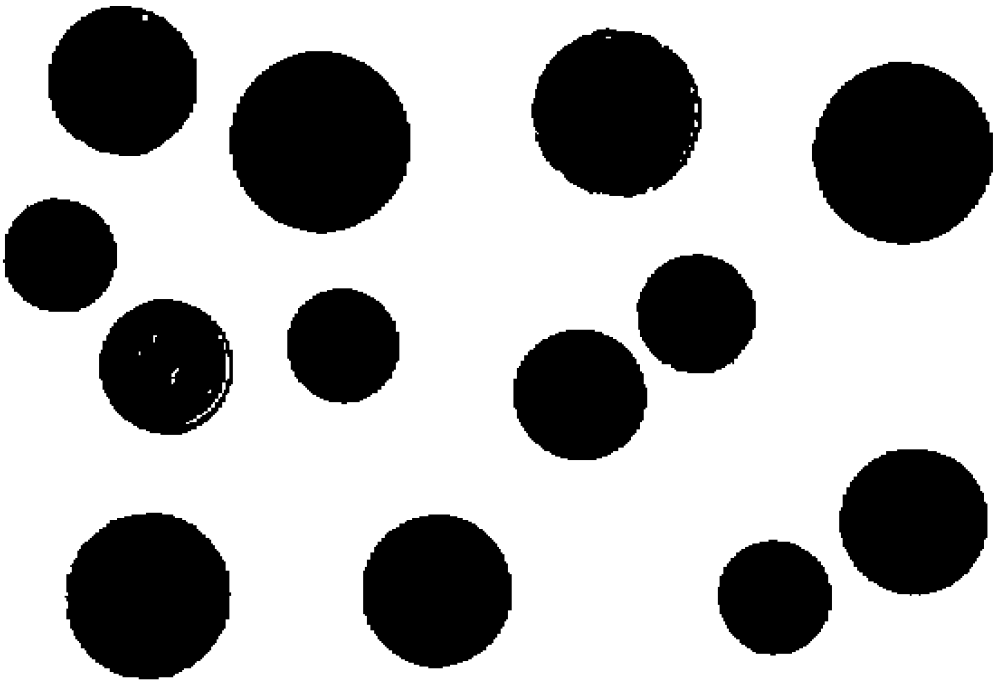
Sessió 5Bis - 17/03

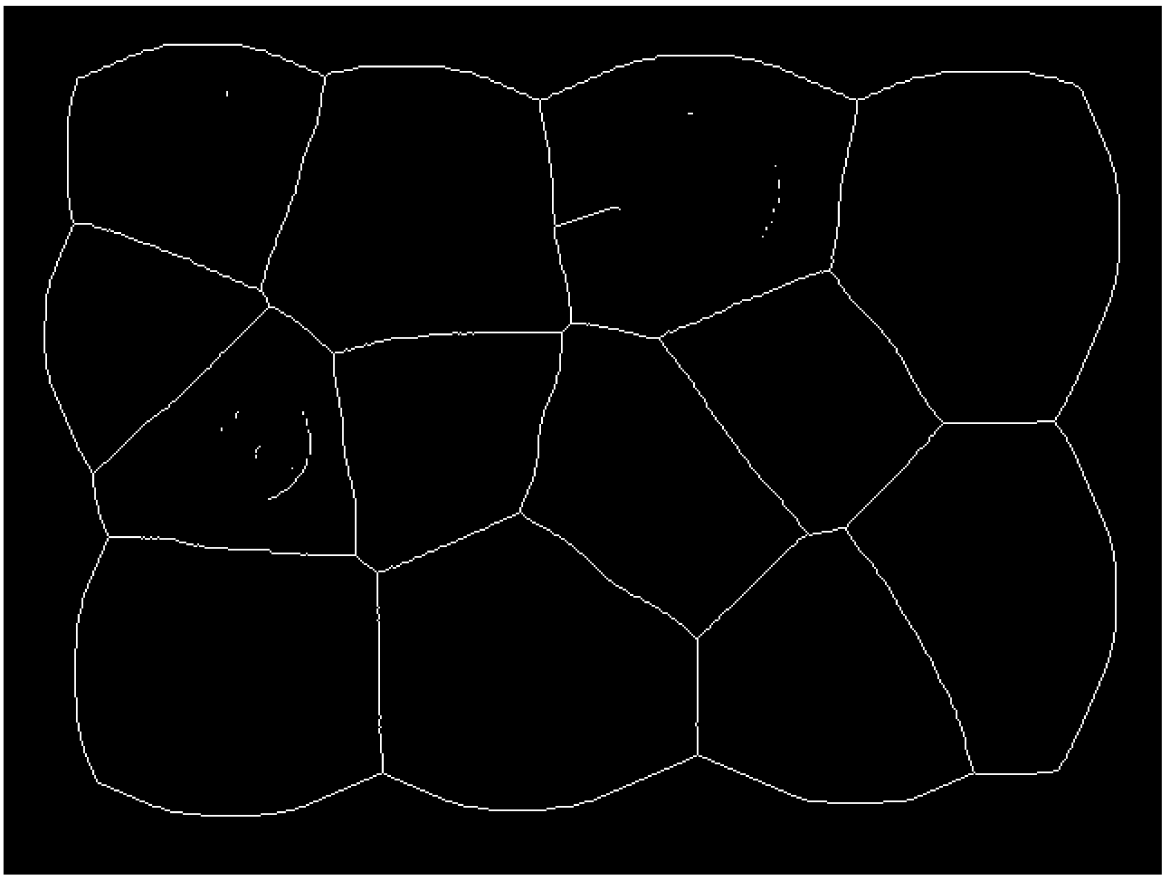
Esquelet

Punts de la figura on hi cap el cercle maxim.

```
I = imread('money.tif');
BW = I > 100;
imshow(not(BW)); % esquelet del background
```



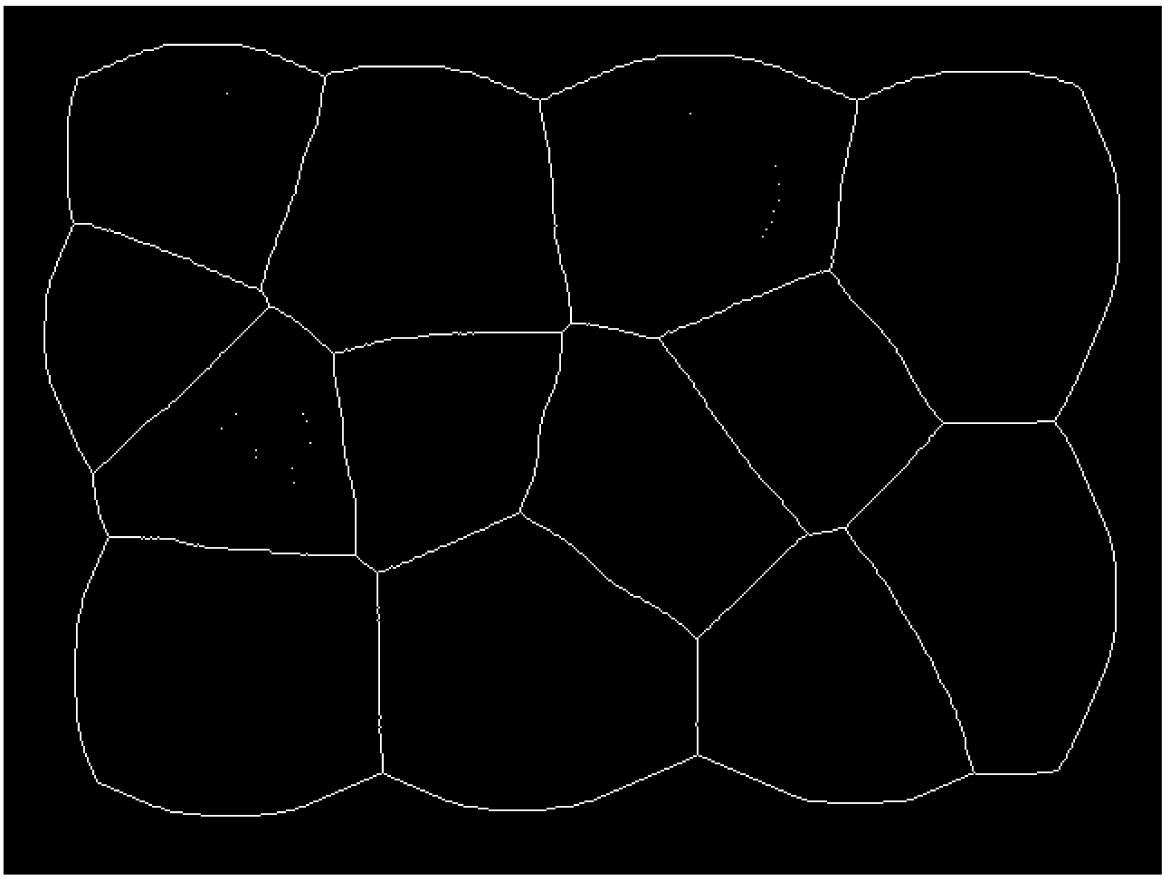
```
SK = bwskel(not(BW));
imshow(SK);
```



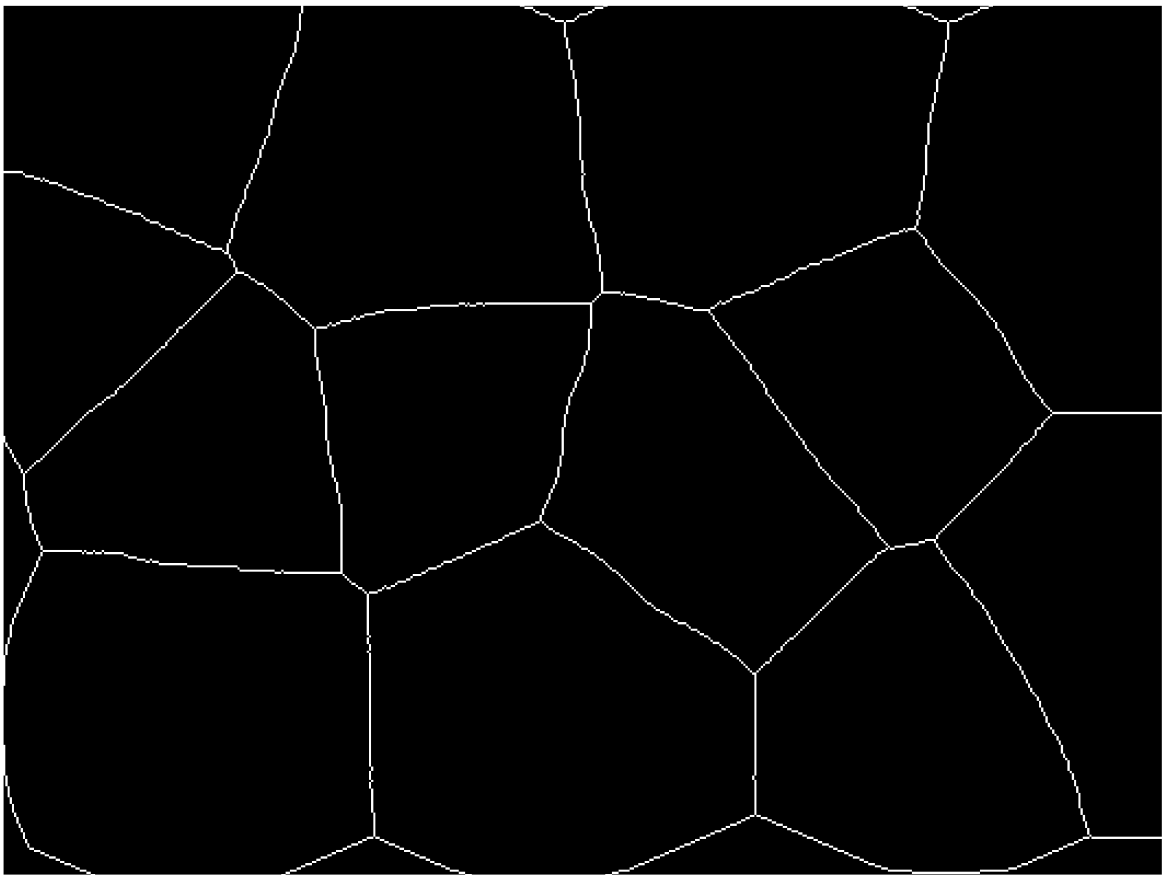
SKIZ

Linia que separa a pixels que estan a la mateixa distancia de "costa". Purguem:

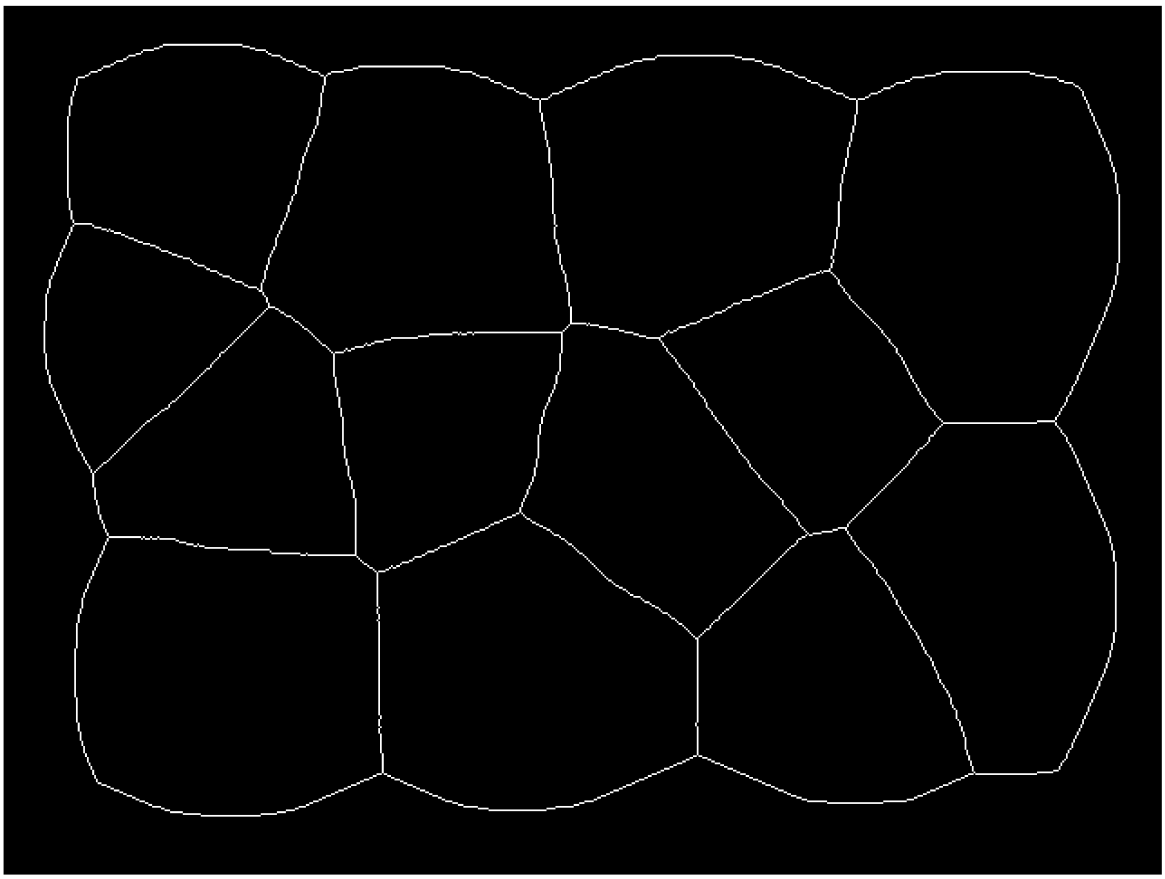
```
SKIZ = bwmorph(SK,"spur",Inf); % 3r param: quants cops vols iterar? Inf: fins que no trobi mes
imshow(SKIZ);
```



```
SKIZ_purgat = bwareaopen(SKIZ,5); % 2n param: quants px ha de tenir la figura com a minim. Elir
imshow(SKIZ_purgat); % treu els objectes aillats que tenen area minima
```

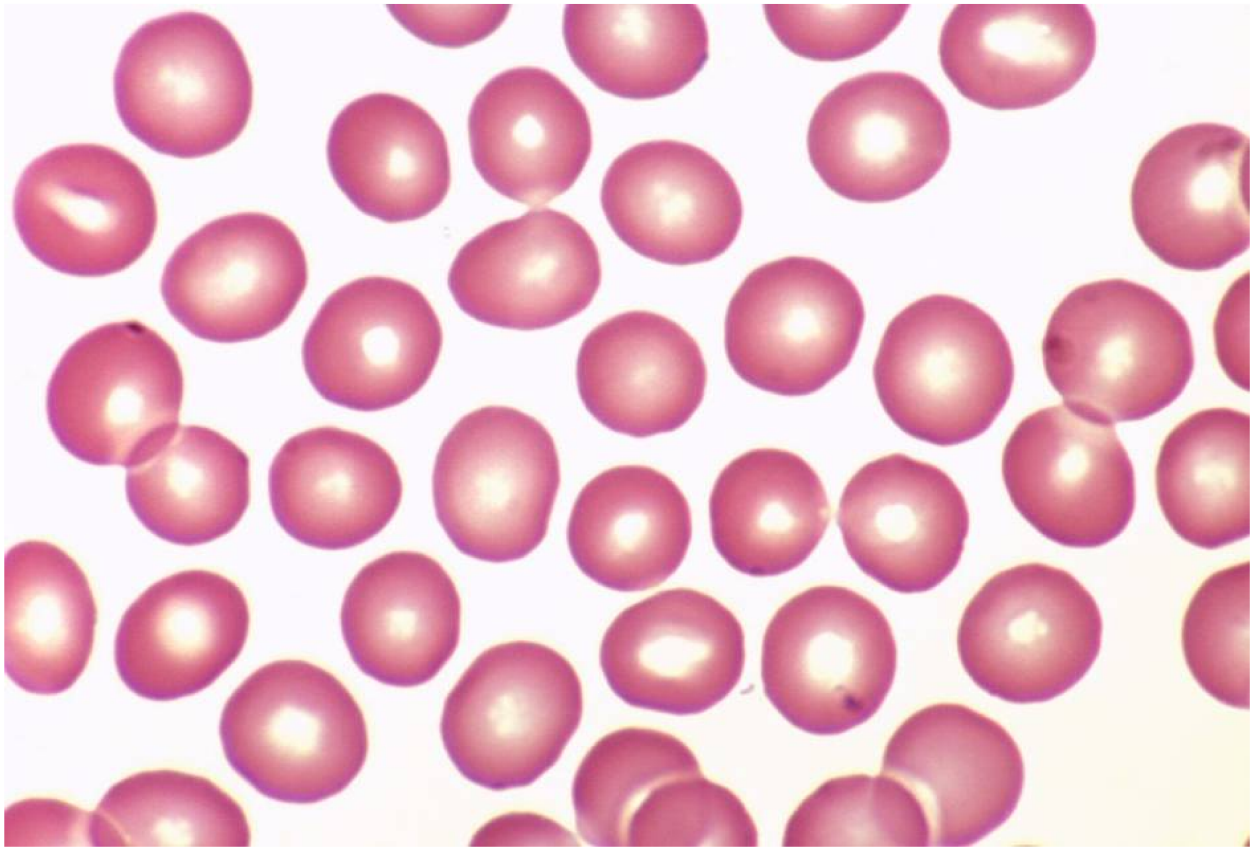


```
% hit & miss
SKIZ_purgat = SKIZ & not(bwhitmiss(SKIZ, [-1 -1 -1; -1 1 -1; -1 -1 -1]));
imshow(SKIZ_purgat); % compleix la cond que el px del mig sigui 1 y la resta del seus veins sig
```

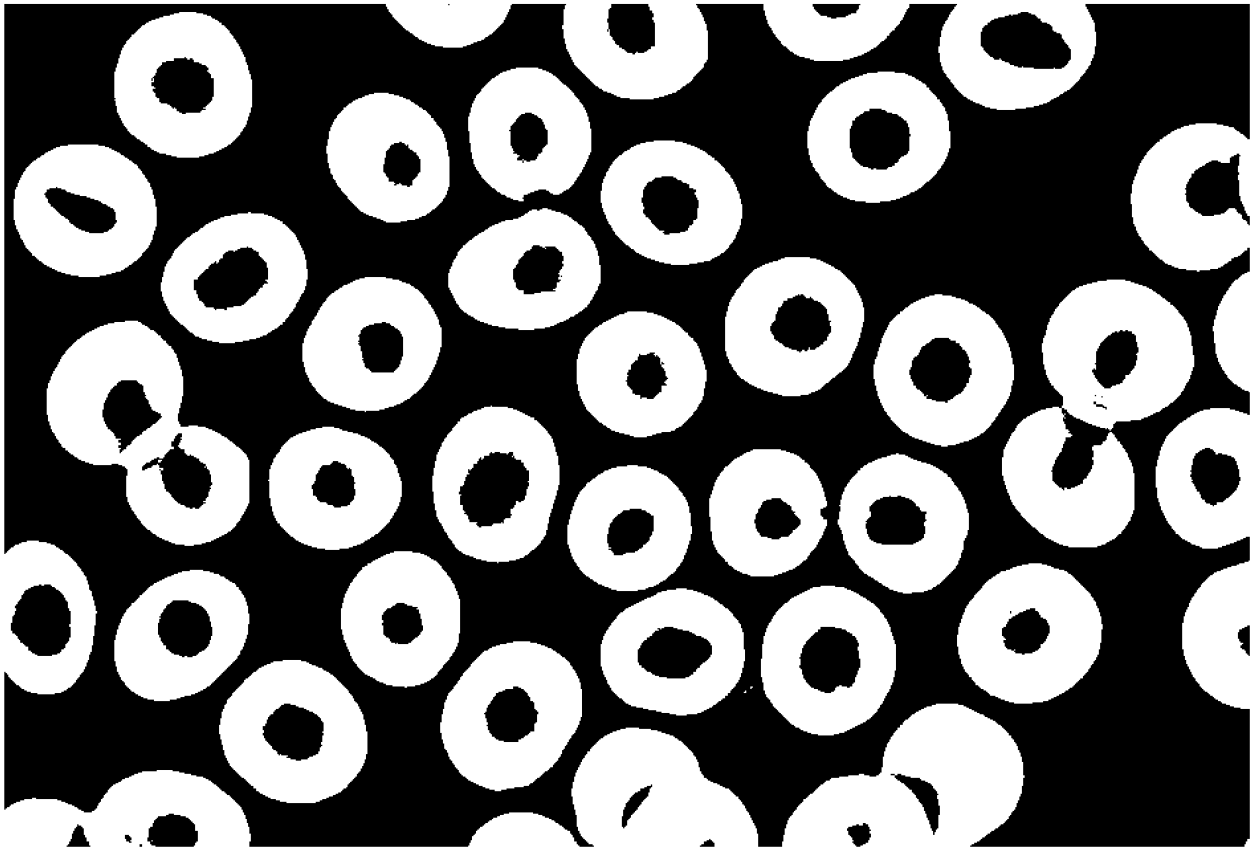


Exercici: trobar la celula més aillada (no de les vores)

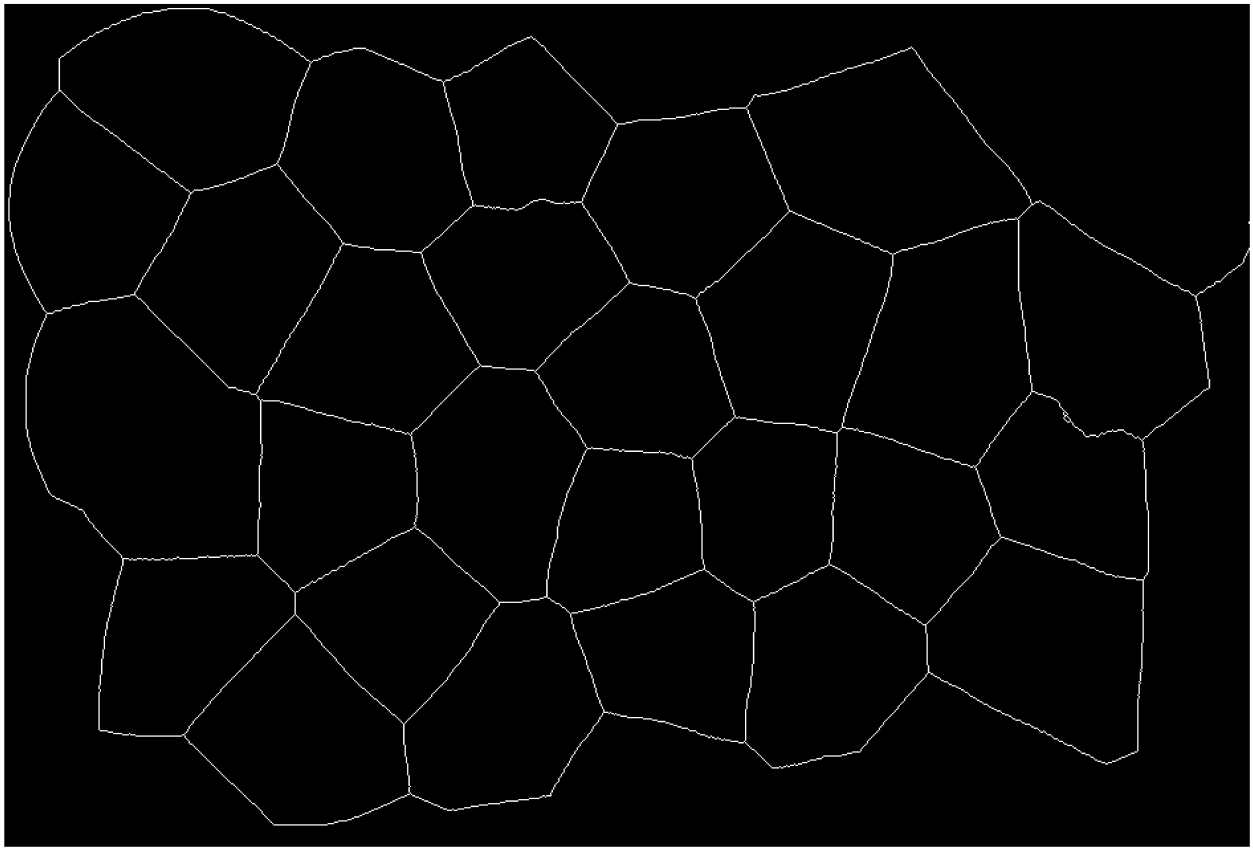
```
RGB = imread('normal-blood1.jpg');
imshow(RGB);
```



```
I =rgb2gray(RGB);
t = otsuthresh(imhist(I));
BW = I < t*255; % ressaltem les celules
imshow(BW);
```



```
BW = imfill(BW,"holes"); % omple forats
BW = bwareaopen(BW,5); % arregla imperfeccions
SK = bwskel(not(BW));
SKIZ = bwmorph(SK,"spur",Inf);
SKIZ = SKIZ & not(bwhitmiss(SKIZ, [-1 -1 -1; -1 1 -1; -1 -1 -1])); % treiem puntets
imshow(SKIZ);
```

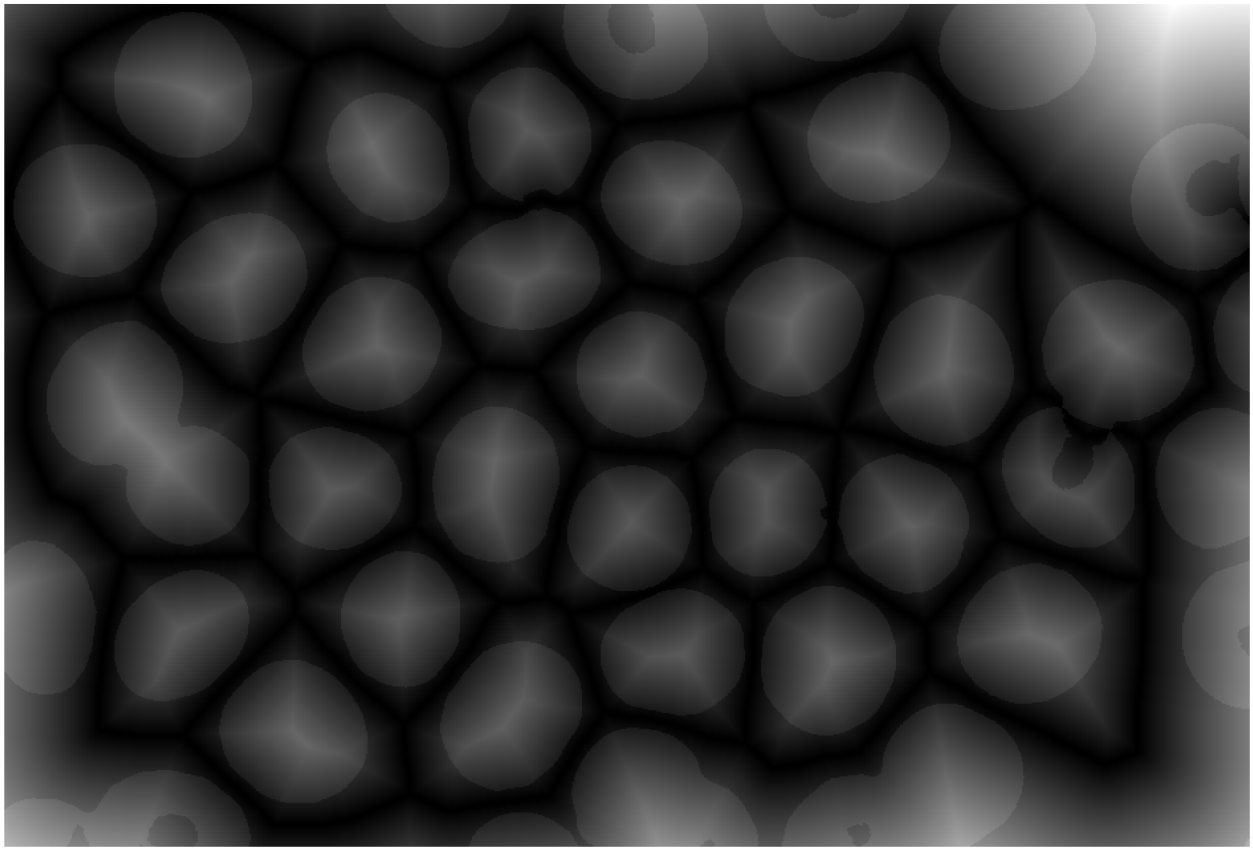


```
% trandofmrada de la distancia del SKIZ
DT = bwdist(SKIZ);

%creem una imatge de marques
MARK = false(size(BW));

% marca a les vores
MARK(1,:) = 1;
MARK(end,:) = 1;
MARK(:,1) = 1;
MARK(:,end) = 1;

% transf de la dist
imshow(DT + 10* BW,[]);
```



```
% vores de les celules
SE = ones(5,5);
BWE = imerode(BW,SE);

% vores = residus intern
RI = BW & not(BWE);

% eliminem les vores que toquen els limits
RI = RI & not(imreconstruct(MARK,RI));

% DTM = DT .* RI;
% imshow(DTM,[]);

% components conectats
CC = bwconncomp(RI);

%cerca del mínim dels components connectats
for i=1:CC.NumObjects
    dist(i) = min(DT(CC.PixelIdxList{i}));
end

[minim,pos] = max(dist);
```

```
% mascara sobre RGB
R = RGB(:,:,1);
G = RGB(:,:,2);
B = RGB(:,:,3);

% els px de les vores a 0
R(CC.PixelIdxList{pos}) = 0;
G(CC.PixelIdxList{pos}) = 0;
B(CC.PixelIdxList{pos}) = 0;

RGB(:,:,1) = R;
RGB(:,:,2) = G;
RGB(:,:,3) = B;

imshow(RGB);
```