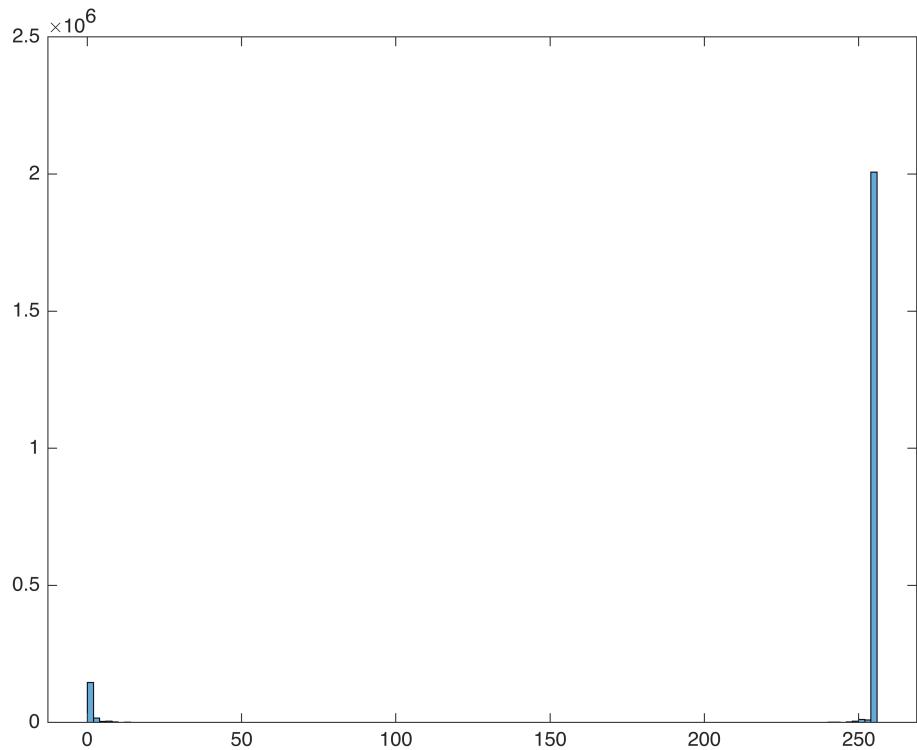
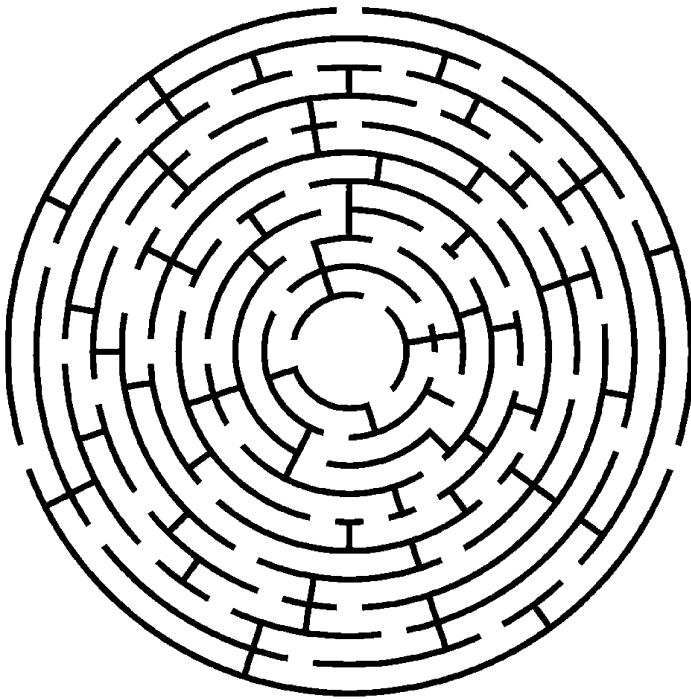


## E5 bis

```
I = rgb2gray(imread("Laberint.png"));
histogram(I);
```

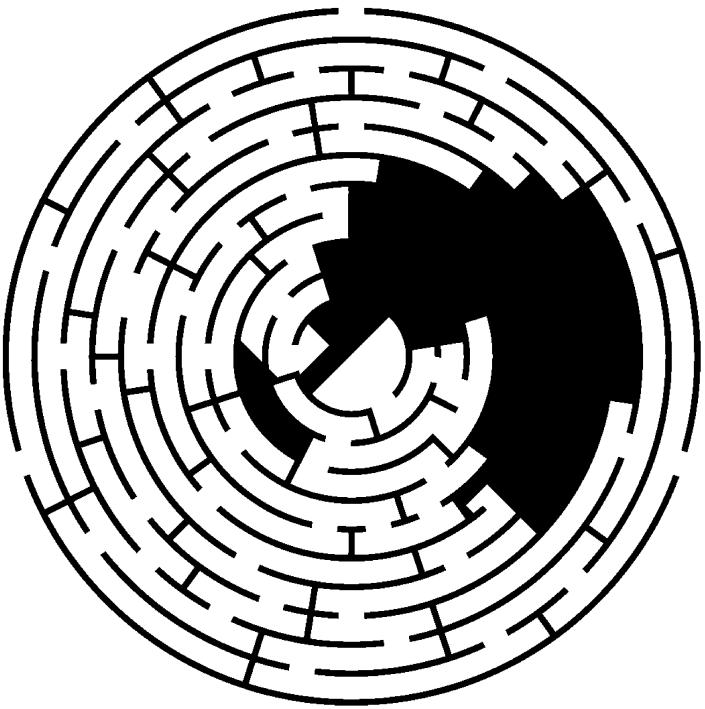


```
BW = I > 128;
montage({BW});
```

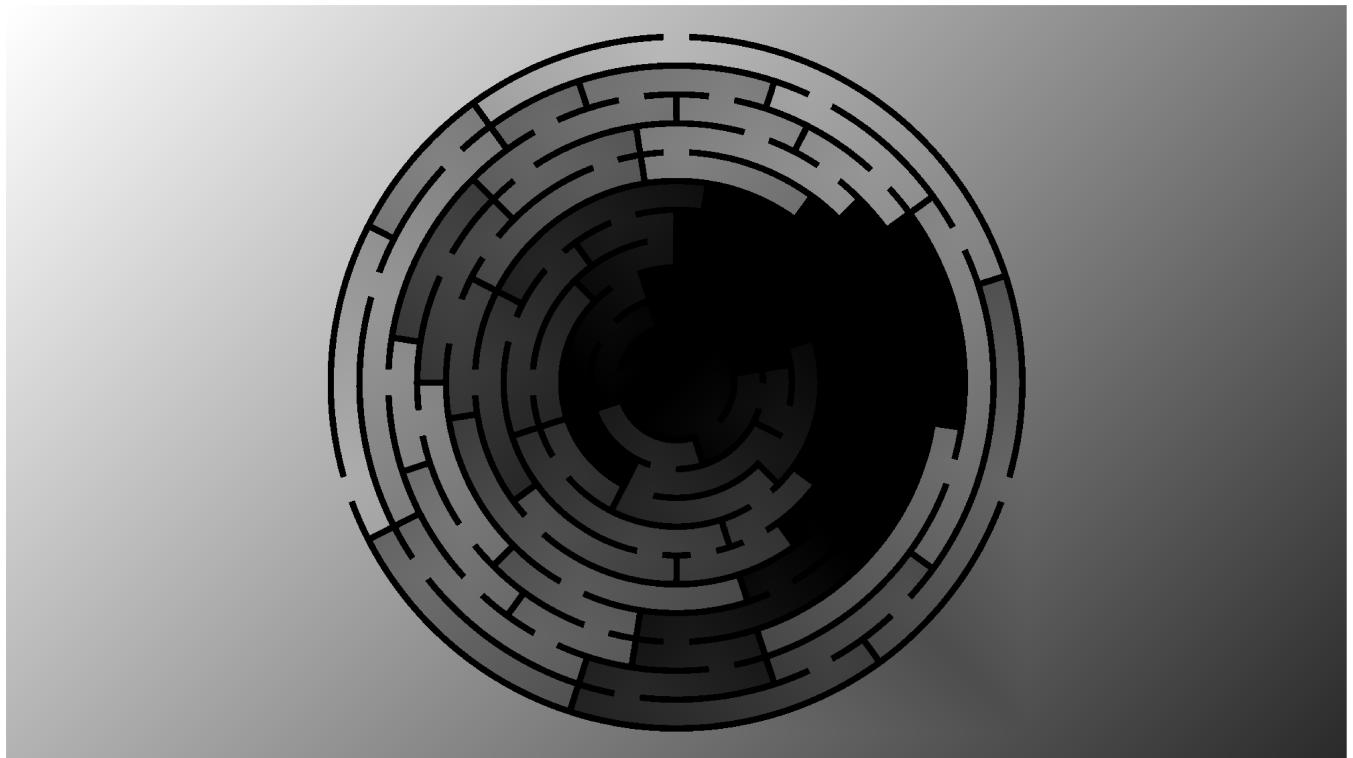


```
MARK = false(size(BW));
DT = zeros(size(BW));
MARK(1,1) = 1; % posició inicial de la partida
SE = [0 1 0; 1 1 1; 0 1 0];
[f c] = size(BW);
centre = [floor(f/2) floor(c/2)];

fi = false;
while(not(fi))
    MARK = imdilate(MARK,SE) & BW;
    %imshow(MARK);
    DT = DT + MARK;
    if MARK(centre(1),centre(2))
        fi = true;
    end
end
imshow(MARK);
```



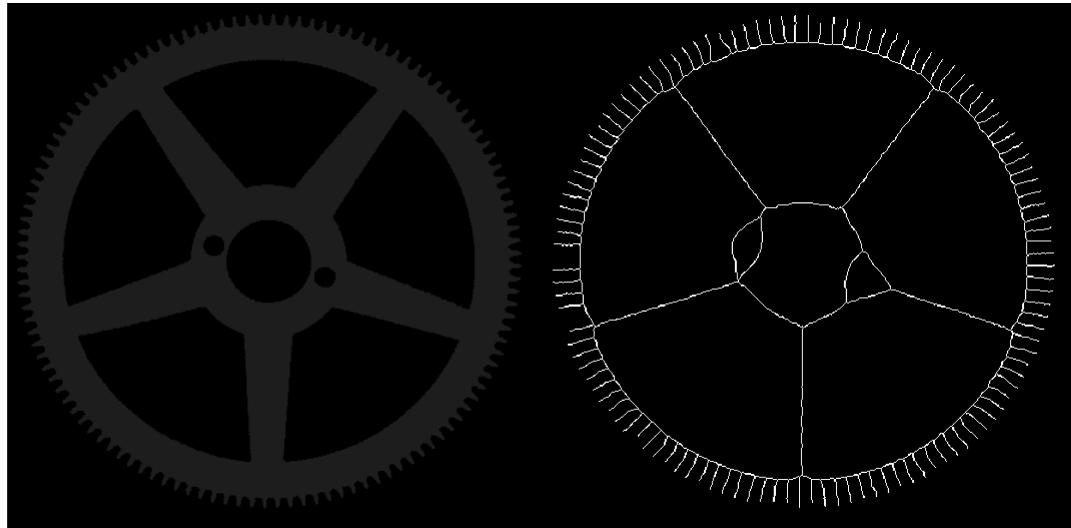
```
imshow(DT, []);
```



```
%DT2 = bwdistgeodesic(BW, )
```

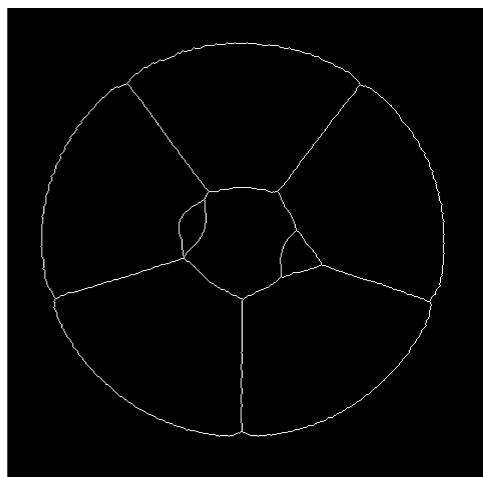
## Esquelets

```
I = rgb2gray(imread("Wheel.bmp"));
BW = I > 15;
SK = bwske1(BW);
montage({I, SK});
```



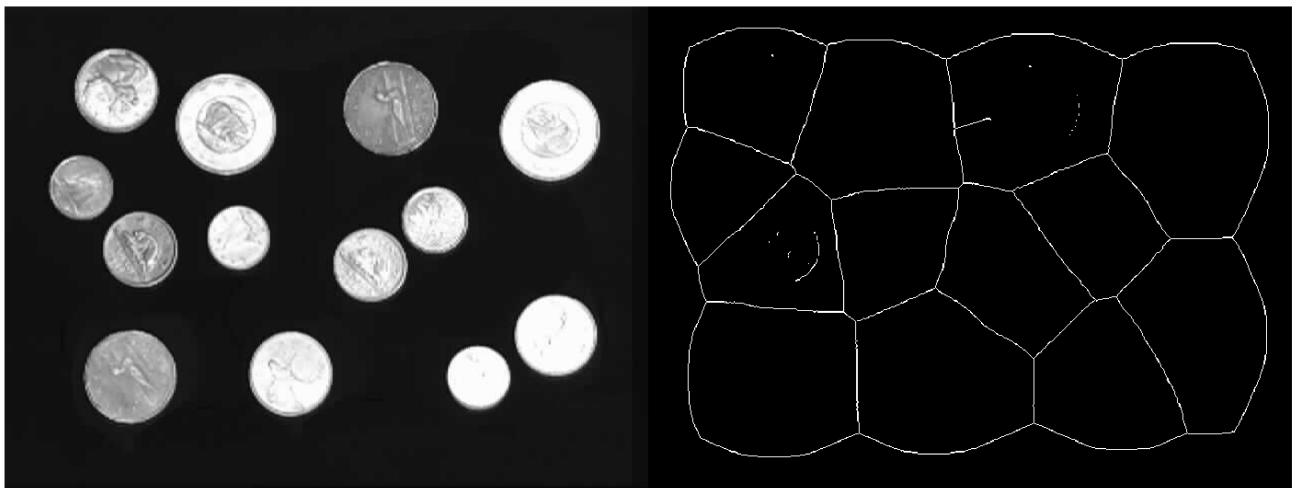
## SKIZ

```
SKIZ = bwmorph(SK, 'spur', Inf);
imshow(SKIZ);
```

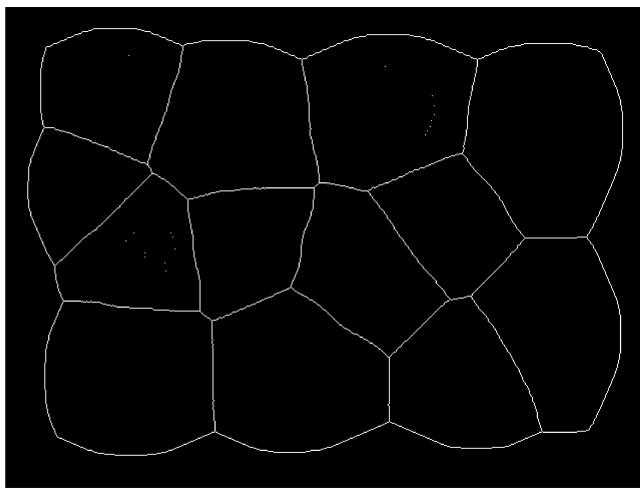


```
I = imread("money.tif");
```

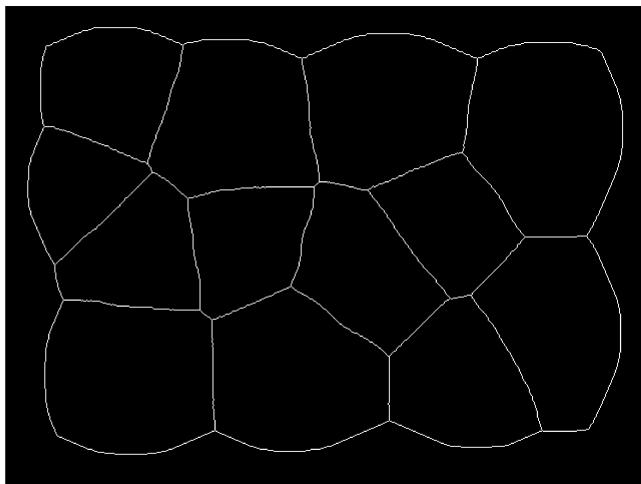
```
BW = I > 100;  
SK = bwskeI(not(BW)); % esquelet del background  
montage({I, SK});
```



```
SKIZ = bwmorph(SK, 'spur', Inf);  
imshow(SKIZ);
```

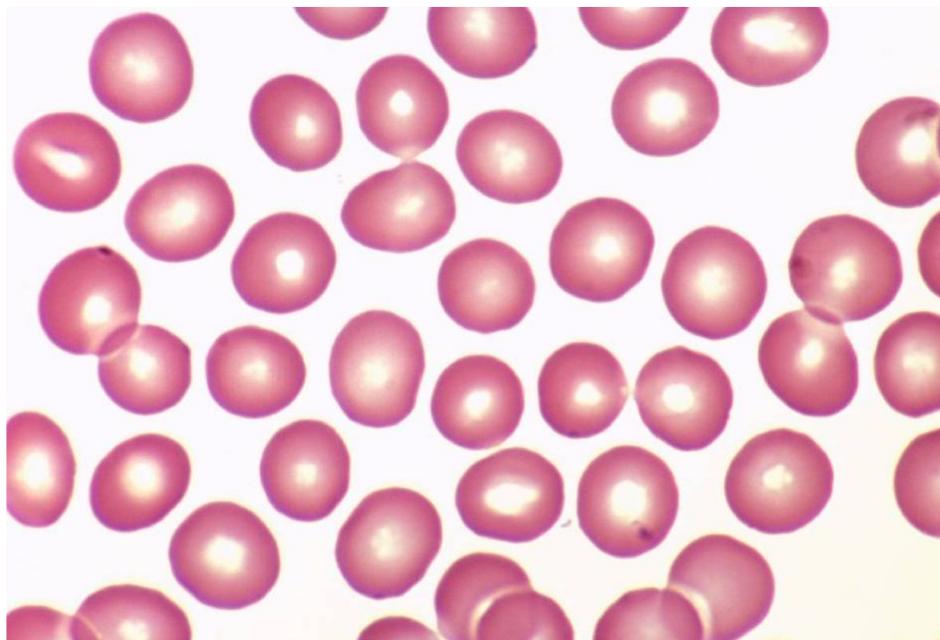


```
% SKIZP = bwareaopen(SKIZ, 10);  
% hit and miss  
SKIZP = SKIZ & not(bwhitmiss(SKIZ, [-1 -1 -1; -1 1 -1; -1 -1 -1]));  
imshow(SKIZP);
```



Exercici: indicar en la imatge RGB la cèl·lula més aïllada que no formi part de la vora

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



```
I = rgb2gray(RGB);
t = otsuthresh(imhist(I));
BW = I < t*255;

% omplir forats
```

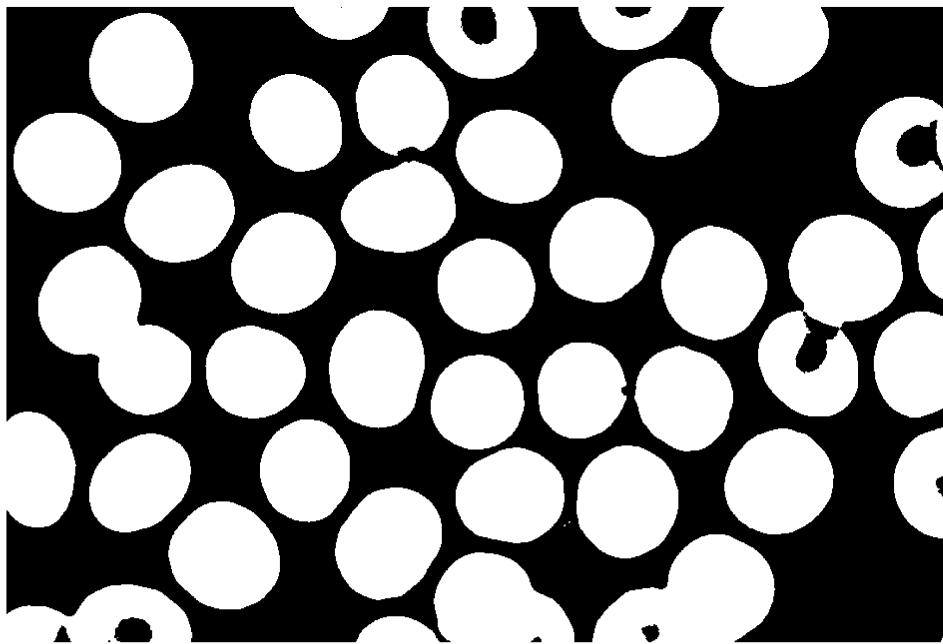
```

MARK = false(size(BW));
MARK(1,:) = 1;
MARK(end,:) = 1;
MARK(:,1) = 1;
MARK(:,end) = 1;

BW = not(imreconstruct(MARK,not(BW)));

imshow(BW);

```



```

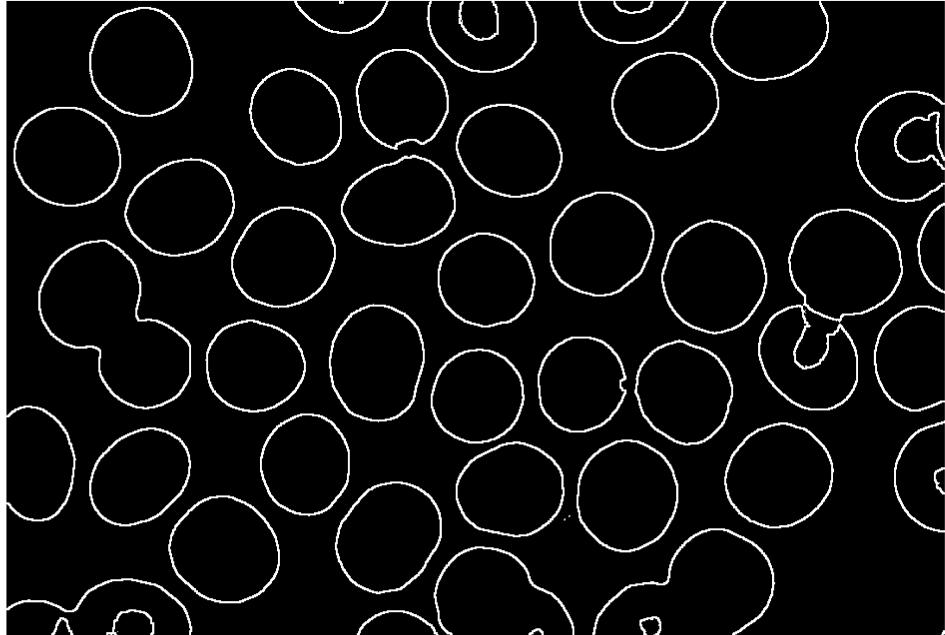
SE = ones(5,5);

% Erosió
BWE = imerode(BW,SE);

% Intern: imatge - erosió
RI = BW & not(BWE);

imshow(RI);

```

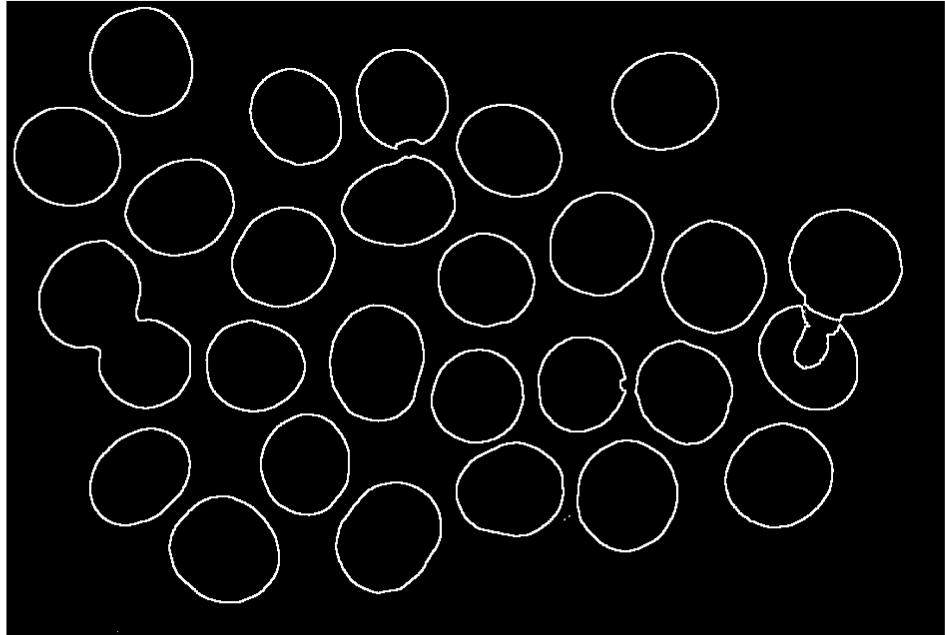


```
SK = bwskel(not(BW));
SKIZ = bwmorph(SK, 'spur', Inf);
SKIZP = SKIZ & not(bwhitmiss(SKIZ, [-1 -1 -1; -1 1 -1; -1 -1 -1]));
%imshow(SKIZP|REC);

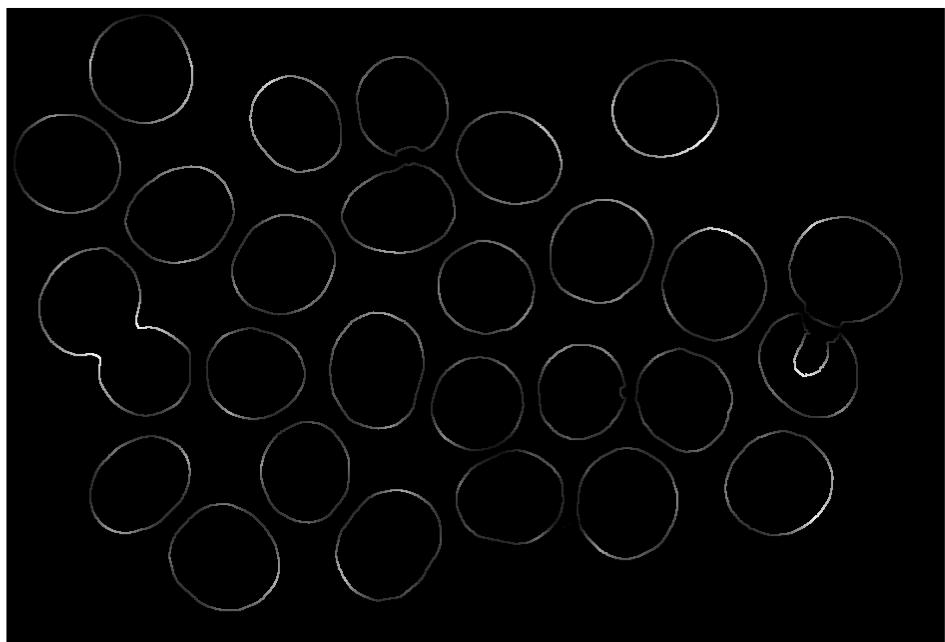
% transformada de la distancia
TD = bwdist(SKIZP);

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

imshow(RI);
```



```
DTM = TD .* RI;  
imshow(DTM, []);
```



```
% components conectats  
CC = bwconncomp(RI);
```

```

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

[minim, pos] = max(dist);

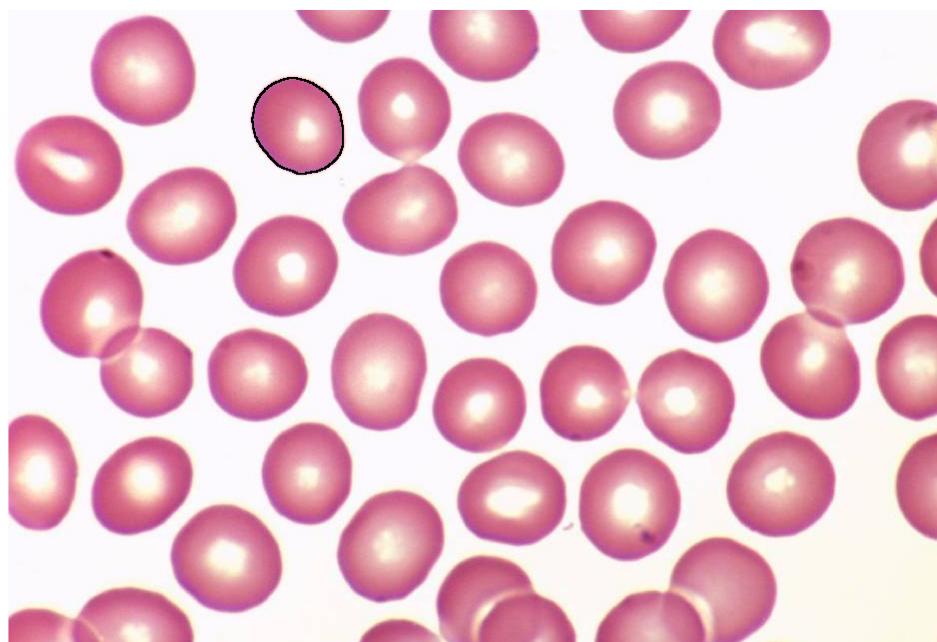
R = RGB(:,:,1);
G = RGB(:,:,2);
B = RGB(:,:,3);

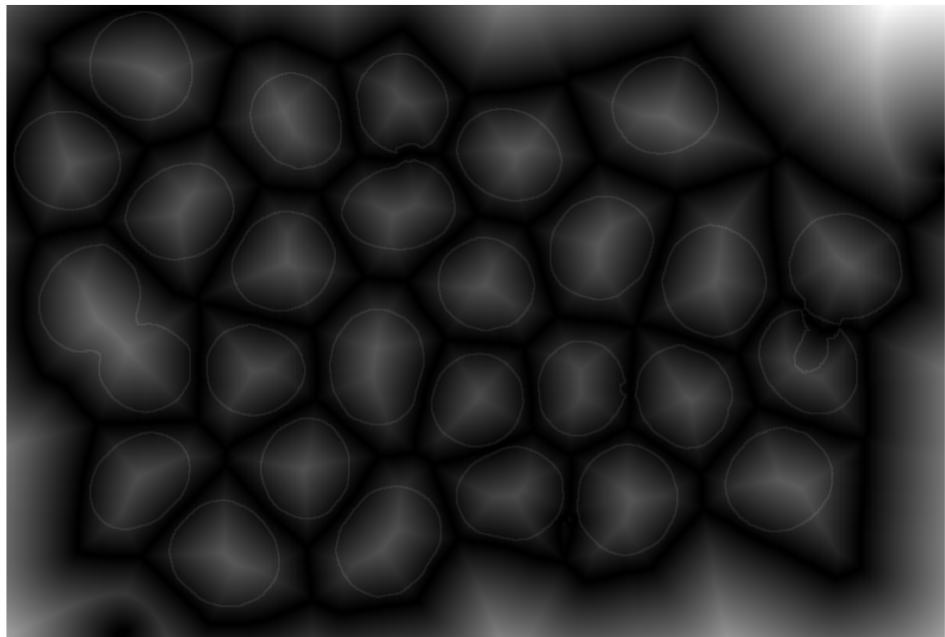
R(CC.PixelIdxList{pos}) = 0;
G(CC.PixelIdxList{pos}) = 0;
B(CC.PixelIdxList{pos}) = 0;

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

imshow(RGB);

```





```
imshow(TD + 10 * RI, []);
```