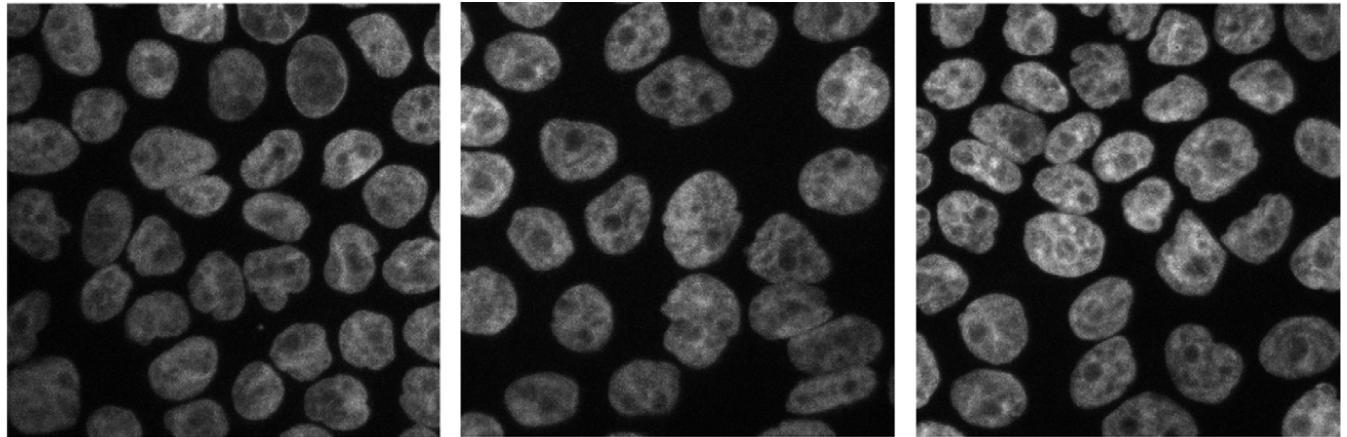


# E7

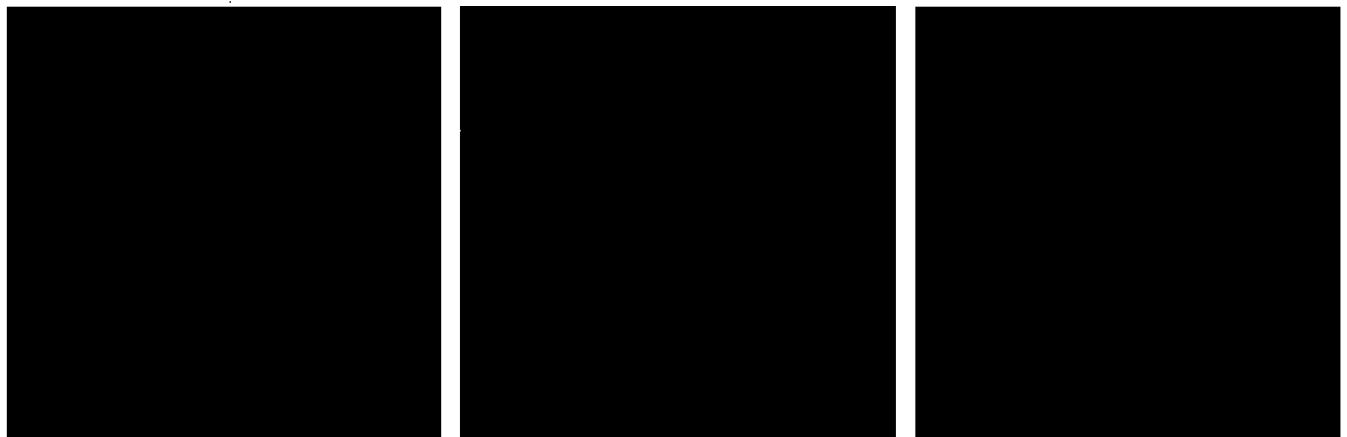
## Segmentació de la imatge

### Watershed

```
I = rgb2gray(imread("cellsegmentationcompetition.png"));
imshow(I);
```



```
BW = I > 250;
M = false(size(I)); M(:,1) = 1; M(:,end) = 1; M(1,:) = 1; M(end,:) = 1;
REC = imreconstruct(M,BW);
imshow(REC);
```



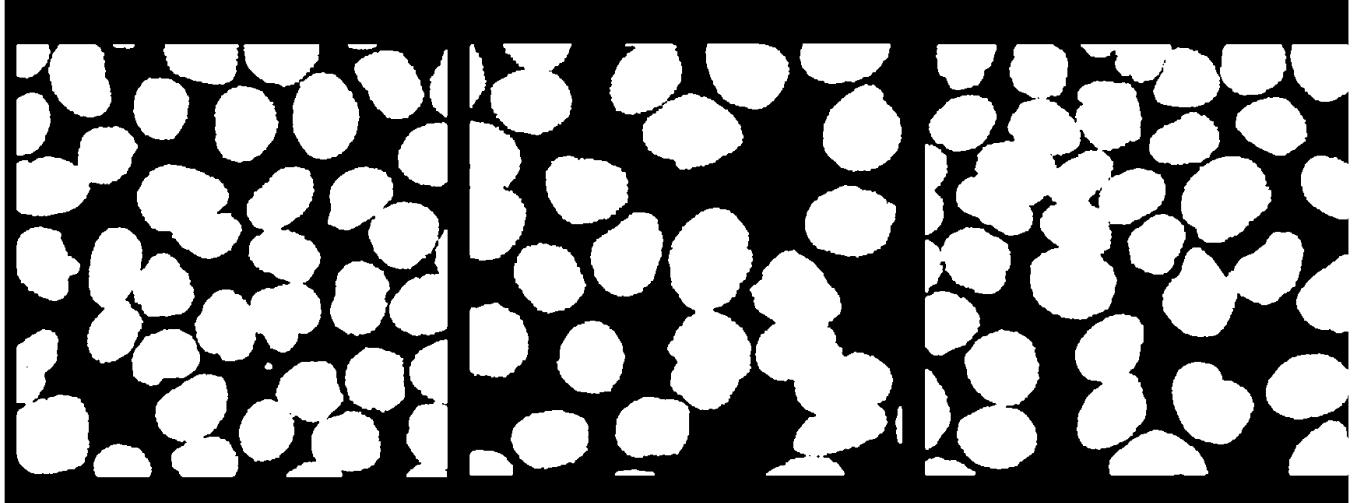
```
REC = imdilate(REC,strel("square",5));
```

```

I = I - 255*uint8(REC);

I = medfilt2(I,[3 3]);
BW = I > 16;
BW = imopen(BW,strel("square",3));
imshow(BW);

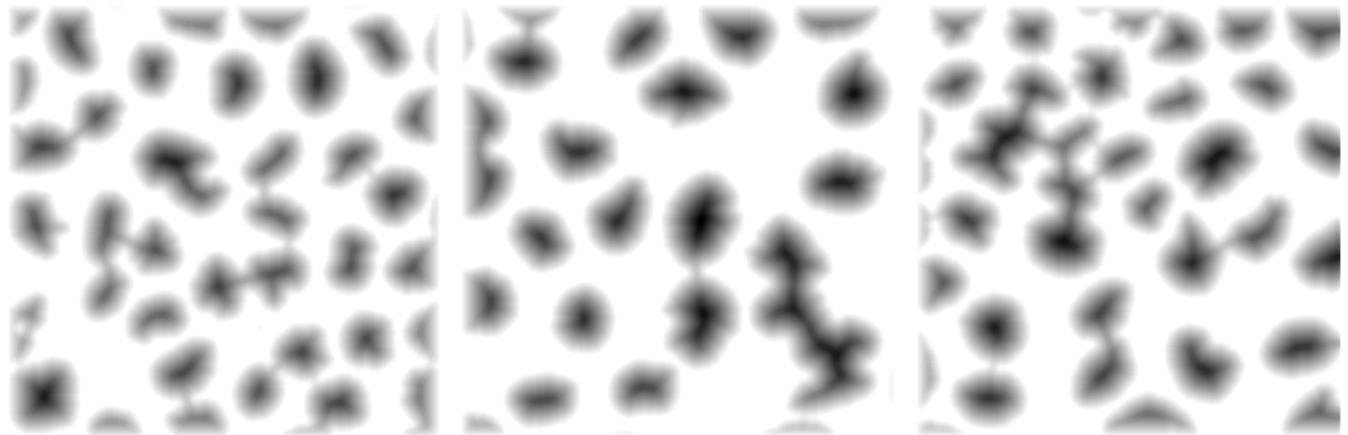
```



```

TD = -bwdist(not(BW),"quasi-euclidean");
TD = medfilt2(TD,[9 9]);
imshow(TD,[]);

```



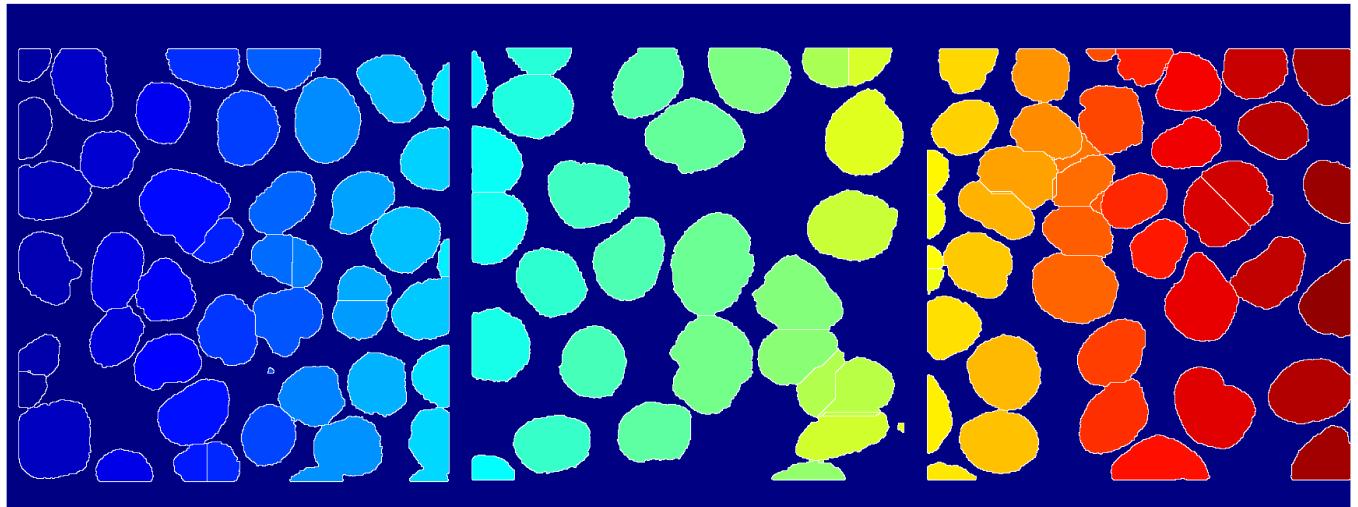
```

TD(not(BW)) = -Inf; % per evitar la propagació de l'aigua en el Background
WS = watershed(TD);

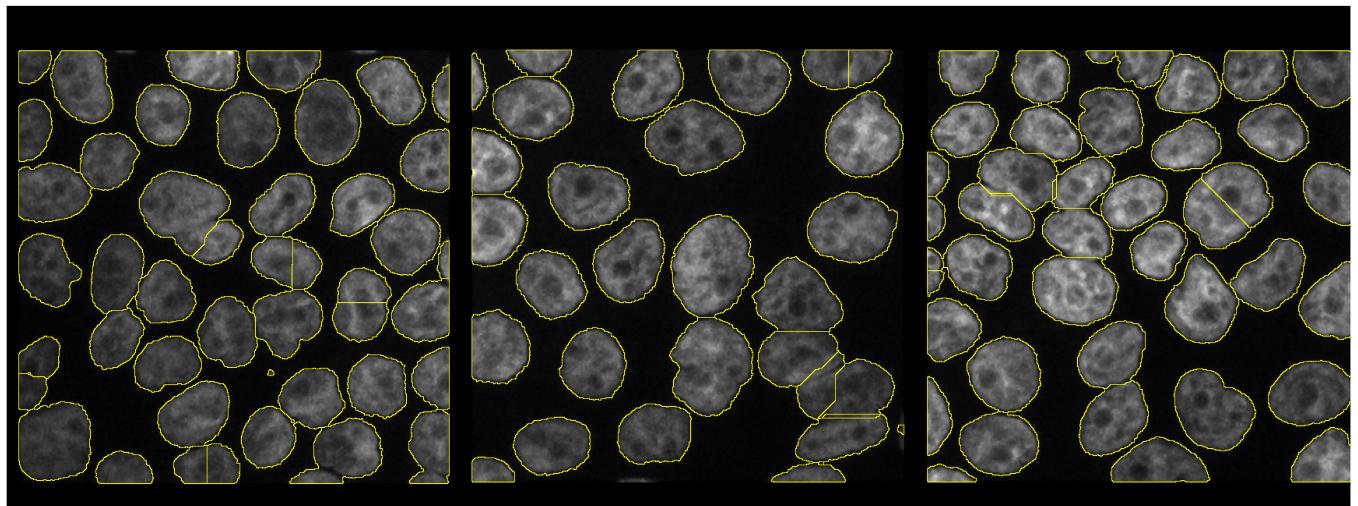
IB = WS == 0;

```

```
RGB = label2rgb(WS);
imshow(RGB);
```

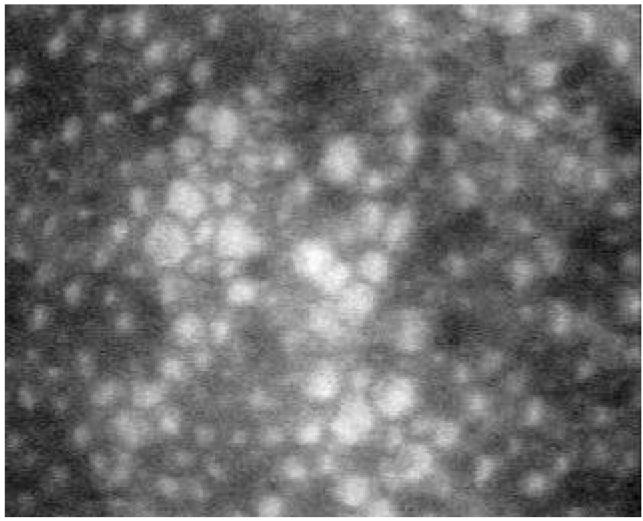


```
RGB2 = imoverlay(I,IB);
imshow(RGB2);
```



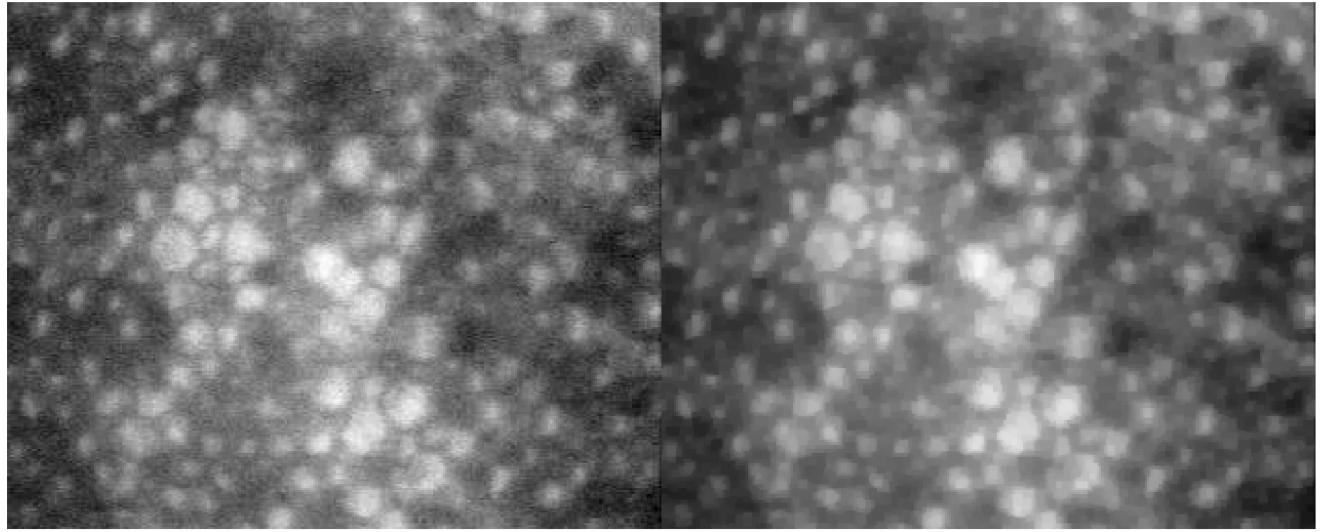
### Exercici Cornea

```
I = imread("cornea.tif");
imshow(I);
```



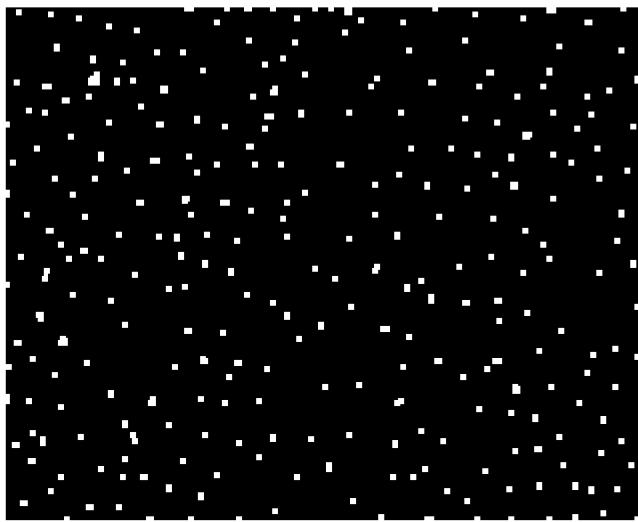
```
%filtrat
```

```
SE = ones(3,3);  
IF = imopen(I,SE);  
IF = imclose(IF,SE);  
montage({I,IF});
```

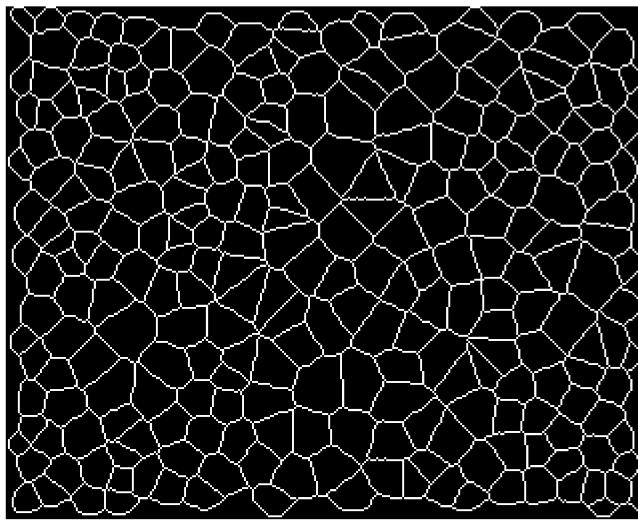


```
% maxims regionals
```

```
MR = imregionalmax(IF);  
imshow(MR);
```

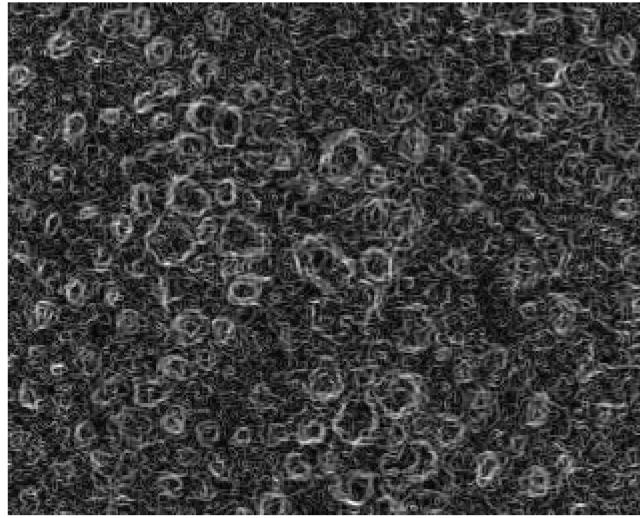


```
% SKIZ
SK = bwskel(not(MR));
SKIZ = bwmorph(SK, 'spur', Inf);
% hit and miss
SKIZ = SKIZ & not(bwhitmiss(SKIZ, [-1 -1 -1; -1 1 -1; -1 -1 -1]));
imshow(SKIZ);
```



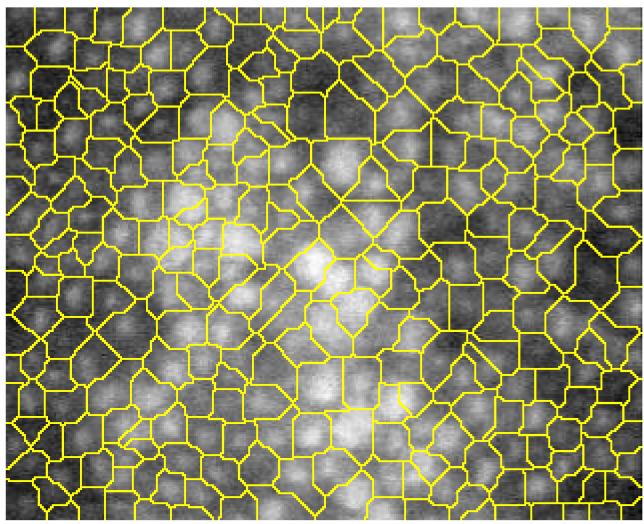
```
% imatge gradient
```

```
G = imggradient(I);
imshow(G, []);
```



```
% Watershed
TD = -bwdist(not(MR), "quasi-euclidean");
%TD = medfilt2(TD,[1 1]);
WS = watershed(TD);
IB = WS == 0;

RGB = imoverlay(I,IB);
imshow(RGB);
```



## Segmentació per color

Simplificar el nombre de colors

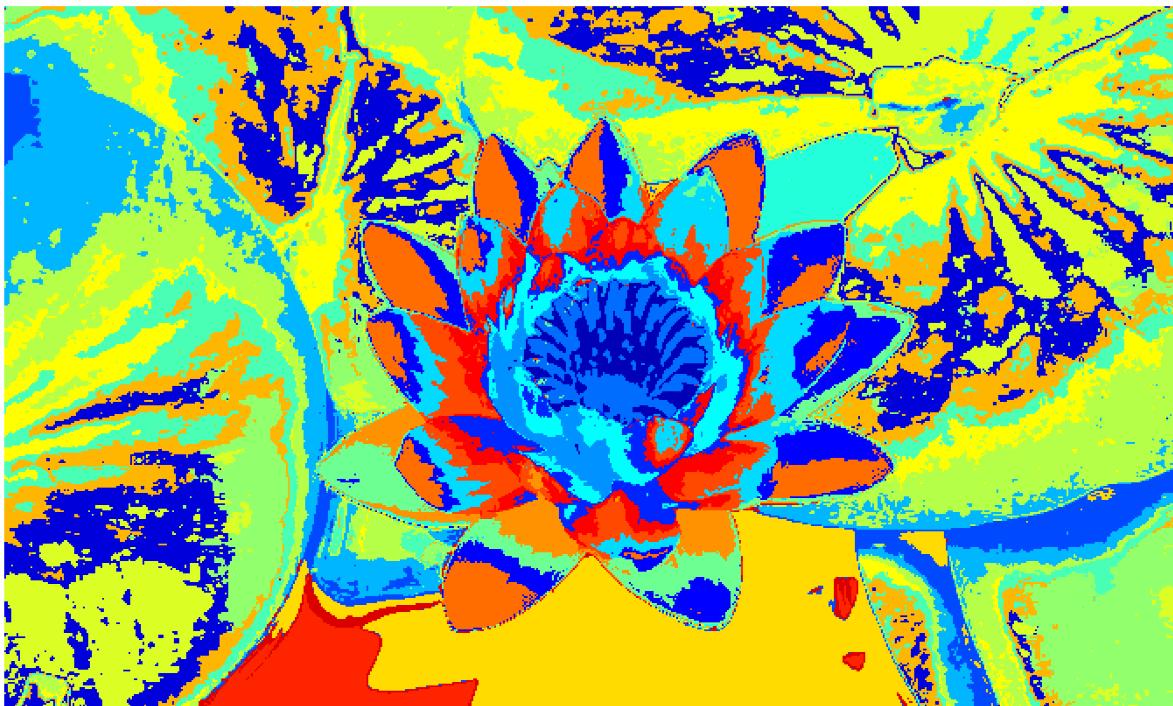
```
I = imread('nenufar.jpg');
imshow(I);
```



```
[f c p] = size(I);

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

O = [R(:), G(:), B(:)];
[C, Centroide] = kmeans(double(O),25); % segon paràmetre indica el nombre de classes
C = reshape(C,[f c]);
RGB = label2rgb(C);
imshow(RGB);
```



```
RGB2 = I;
for i = 1:f
    for j = 1:c
        rgb = Centroide(C(i,j),:);
        RGB2(i,j,1) = uint8(rgb(1));
        RGB2(i,j,2) = uint8(rgb(2));
        RGB2(i,j,3) = uint8(rgb(3));
    end
end
imshow(RGB2);
```

