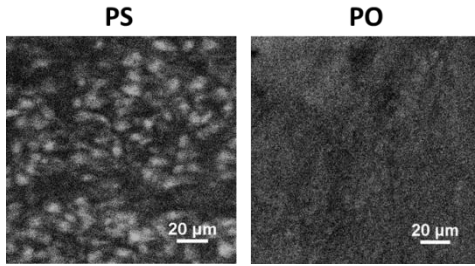# Supplementary material

Figure S1 Confocal images of porcine gastric mucus after mixing with respectively PS and PO oligonucleotides. Images from FRAP experiments prior to bleaching.

Supplementary Materials and Methods

FRAP model

The local diffusion coefficient (D) and the fraction of mobile (k) and immobile oligonucleotides can be calculated by fitting the pixel values of the recovery images $F(x,y,t)$ to the rFRAP model given by the following Eq (1) and (2) [1]:

$$\frac{F(x,y,t)}{F_0} = 1 - \frac{K_0}{4}\left[\text{erf}\left(\frac{x+\frac{l_x}{2}}{\sqrt{r^2+4D_it}}\right) - \text{erf}\left(\frac{x-\frac{l_x}{2}}{\sqrt{r^2+4D_it}}\right)\right]$$

$$\times \left[\text{erf}\left(\frac{x+\frac{l_y}{2}}{\sqrt{r^2+4D_it}}\right) - \text{erf}\left(\frac{x-\frac{l_y}{2}}{\sqrt{r^2+4D_it}}\right)\right] \quad (1)$$

$$F_k(x,y,t) = F(x,y,0) + k[F(x,y,t) - F(x,y,0)] \quad (2)$$

F_0 being fluorescence before photobleaching, K_0 the amount of photobleaching, l_x the width of the bleached rectangle, l_y the height of the bleached rectangle, r^2 the average of the squared lateral imaging and photobleaching resolution, and D the diffusion coefficient. The parameter r takes the

finite imaging and effective bleaching resolution into account. Having the fluorescence recovery *F(x,y,t)* defined by Eq.(1), the fraction of mobile molecules (*k*) can be determined by Eq.(2).

Supplementary References

1.   Deschout, H, Hagman, J, Fransson, S, Jonasson, J, Rudemo, M, Loren, N, et al. (2010). Straightforward frap for quantitative diffusion measurements with a laser scanning microscope. Opt Express 18: 22886-22905.