SUPPLEMENTARY MATRERIAL I

Derivation of oligomer distribution

According to the model in figure 4A, an oligomer consisting of n monomers is given by

$$A_n = (K_a)^{n-1} A_1 = (\tfrac{\alpha'}{\beta})^{n-1} A_1$$

with α' = α [Cry1Aa]. The above statement is equivalent to the equation

$$A_n = K_a A_{n-1} = \tfrac{\alpha'}{\beta} A_{n-1}$$

This can be shown for A_2 from the differential equation describing the temporal evolution of A_1:

$$\tfrac{d}{dt} A_1 = -\alpha' A_1 + \beta A_2 ,$$

and in equilibrium

$$\tfrac{d}{dt} A_1 = 0$$
$$\Rightarrow A_2 = \tfrac{\alpha'}{\beta} A_1$$

We will show that this is true for A_{n+1} under the assumption that it is true for A_n.

$$\tfrac{d}{dt} An = \alpha' A_{n-1} - (\alpha' + \beta) A_n + \beta A_{n+1}$$

$$\textit{with}$$
$$A_{n-1} = \tfrac{\beta}{\alpha'} A_n$$
$$\textit{follows}$$
$$\tfrac{d}{dt} An = \beta A_n - (\alpha' + \beta) A_n + \beta A_{n+1}$$

which should equal zero in equilibrium, thus

$$A_{n+1} = \tfrac{\alpha'}{\beta} A_n$$

As it is true for A_2, it is thus iteratively true for all A_n.

Calculation of the probability to observe x pentamers in an ensemble of N measurements.

The problem was to determine the order (4 or 5) of the binomial distribution that best fit the experimentally observed values. As the distribution of 1-4 subunits may be comparably well fitted by both distributions (but see main text for p-value dependence), the decisive observable is the number of pentamers observed for a given number of spots N analyzed. Let us assume that the distribution has been optimally fitted to a binomial distribution of the order $n = 4$ and 5. For each distribution, a probability for the observance of pentamers will be given. In the case of $n = 4$ this probability will be zero, in the case of $n = 5$, it is given by:

$$\langle x \rangle = N p^5,$$

where N is the number of total spots analyzed and p the probability of a monomer to be detected.

We have to determine the probability *prob(x)* that the experimentally observed number of pentamers x can be explained by a binomial distribution of order $n = 5$ and probability p. To this end, we calculate the value of the Poisson probability density function with parameter $\langle x \rangle$, the expected value of pentamers, for the experimentally observed value x

$$prob(x) = \frac{\langle x \rangle^x}{x!} exp(-\langle x \rangle) = \frac{\left(Np^5\right)^x}{x!} exp(-Np^5)$$

prob(x) gives the probability to observe in an ensemble of N spots which are binomially distributed with order $n = 5$ exactly x pentamers.

The analysis of our experimental data following the above calculations resulted in values below 1% for each condition (mutant and lipid composition). What is more, for each analysis, the observed value x was on the lower end of the Poisson probability density function (Suppl. Fig. 2). We can thus conclude that the observed values are not consistent with a binomial distribution of order $n = 5$ or higher.

Naturally, the probability to observe exactly x pentamers in a binomial distribution or 4^{th} order is zero. However, as explained in the main manuscript, the number of observed pentamers corresponds exactly with the number of pentamers expected due to unspecific labeling.