Supporting Material

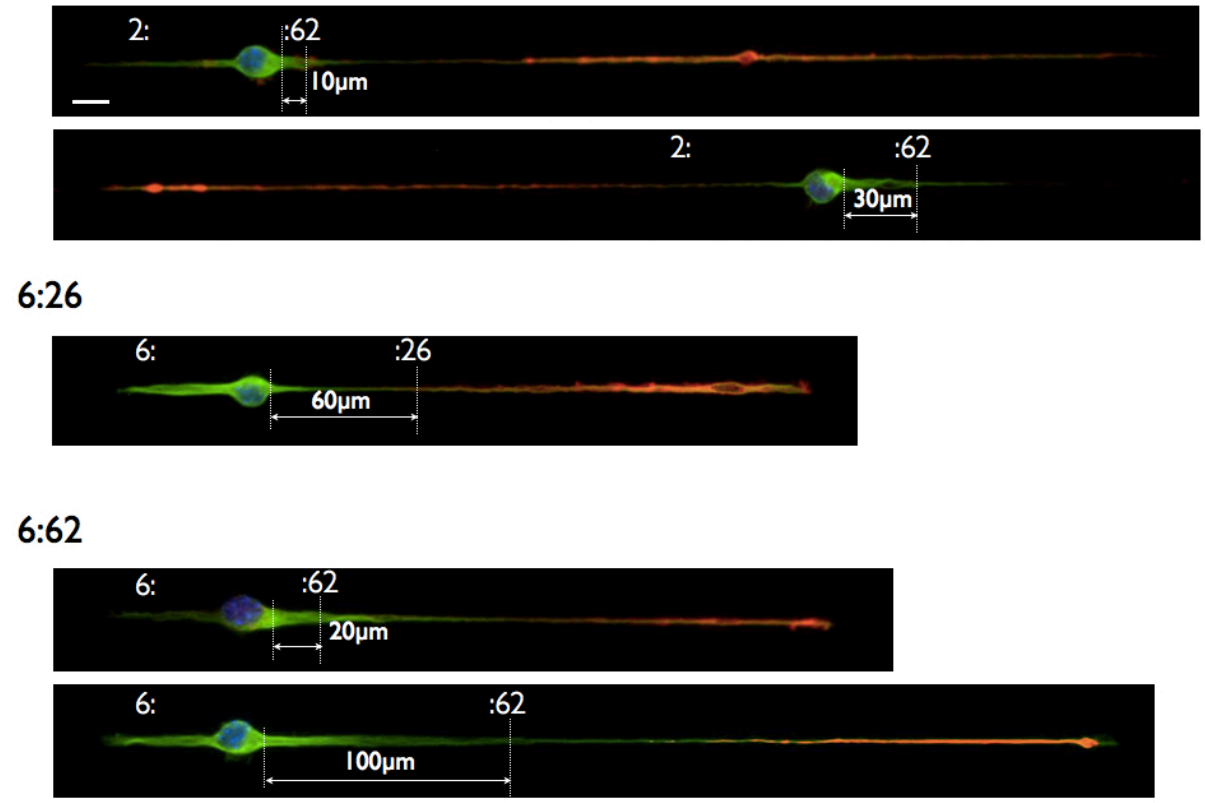


Fig.S1 – Images of polarized neurons on different patterns (namely the 2 :62, 6 :26 and 6 :62 patterns) showing the whole panel of stump length employed in our micro-adhesive geometries (10, 20, 30, 40 60 and 100µm). The numbers in white indicate the position of either the 2:, 6 :, :62 and 26 branches. In the two last cases, these numbers are located at the place of the geometrical transition between the 2 and the 6µm wide stripes.
Microtubules (YL1/2, green), nucleus (Hoechts, blue) and axon (Tau, red).
Scale bars : 15µm.

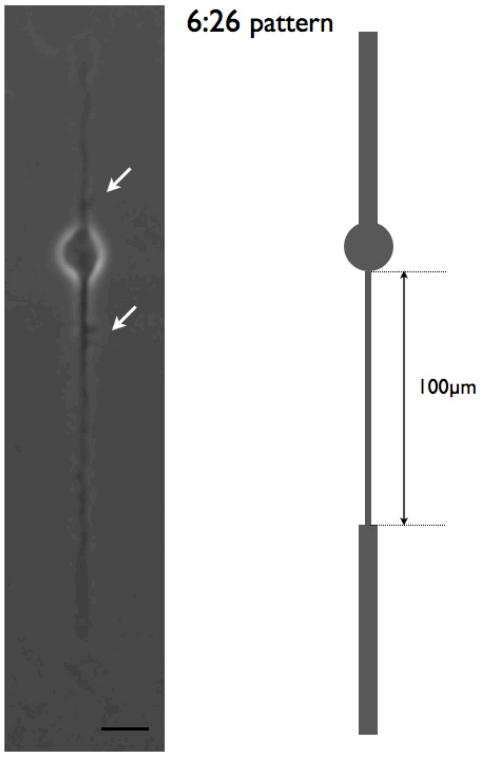
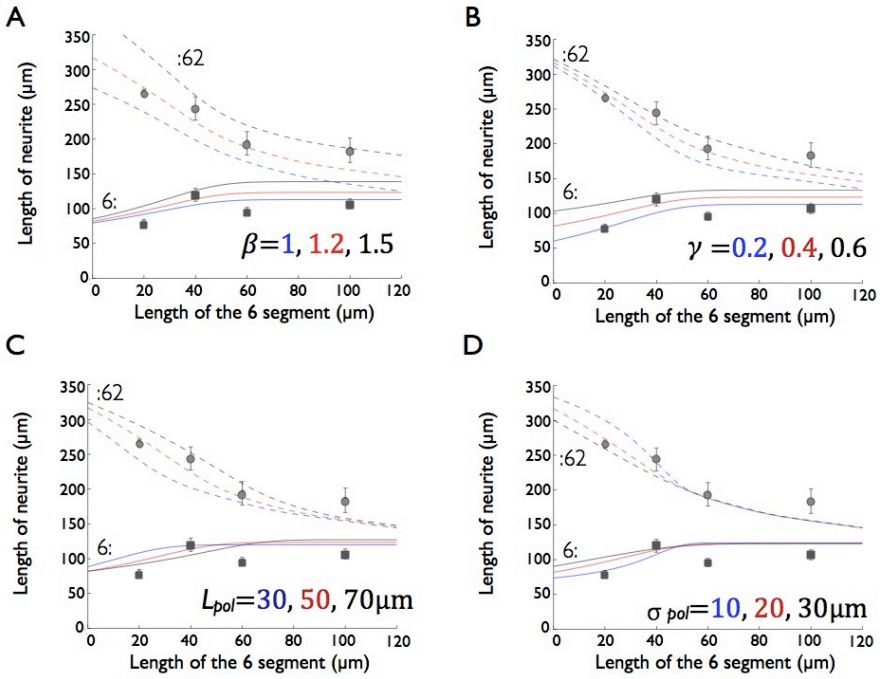


Fig.S2 – Phase contrast image of waves on patterned neurons. Image of a neuron growing on a 6 :26 pattern characterized by a 2µm stump of 100µm in length (pattern in gray on the right). The top neurite, rather than spreading on the 6µm wide stripe, is zigzaging between the edges of the pattern. White arrows point out the presence of propagative growth-cone like structures (so-called waves) on both neurites.
Scale bar : 20 µm.

Length



Polarization

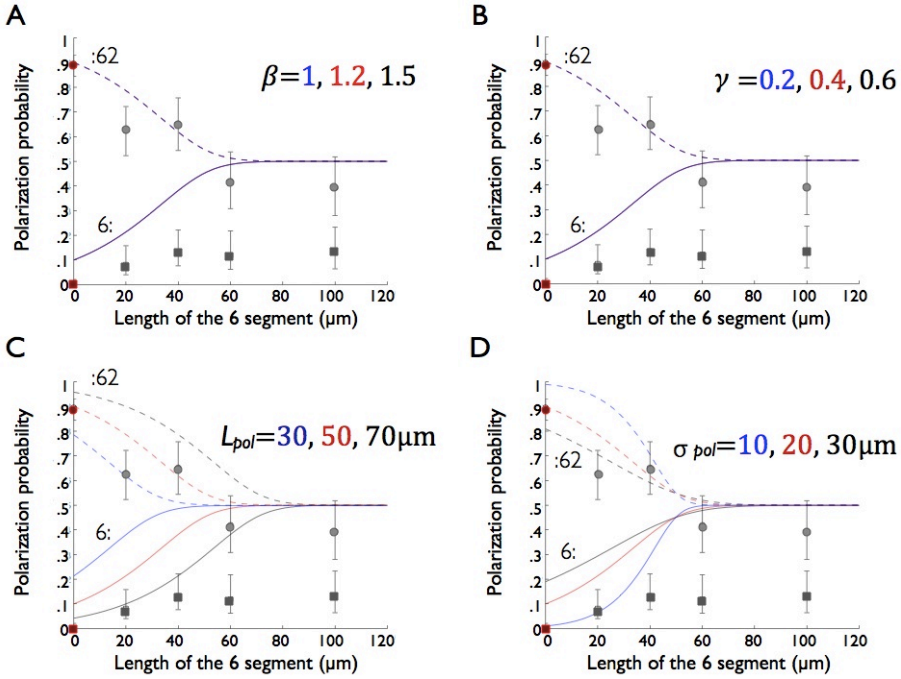


Fig.S3 – Sensitivity of the model to the variation of the parameters □, γ, L_{pol}, σ_{pol} **in the particular case of the 6:62 patterns** (top and bottom graphs : length and polarization results, respectively). Values of the parameters and curves are indicated with an identical color code. Apart from the most important features discussed in the article, a few points emerge from the analysis of these graphs. First, the polarization rates are insensitive to the variations of □ and γ, as expected since these parameters are specifically attached to the length issue. Then, not surprinsingly, to increase □ values results in a faster elongation for the conditions associated to the highest polarization rate (mainly for the :62 branch). At last, and as expected,

decreasing the values of σ_{pol} enlarges the difference between the polarization rates along the 6: and :62 sides.

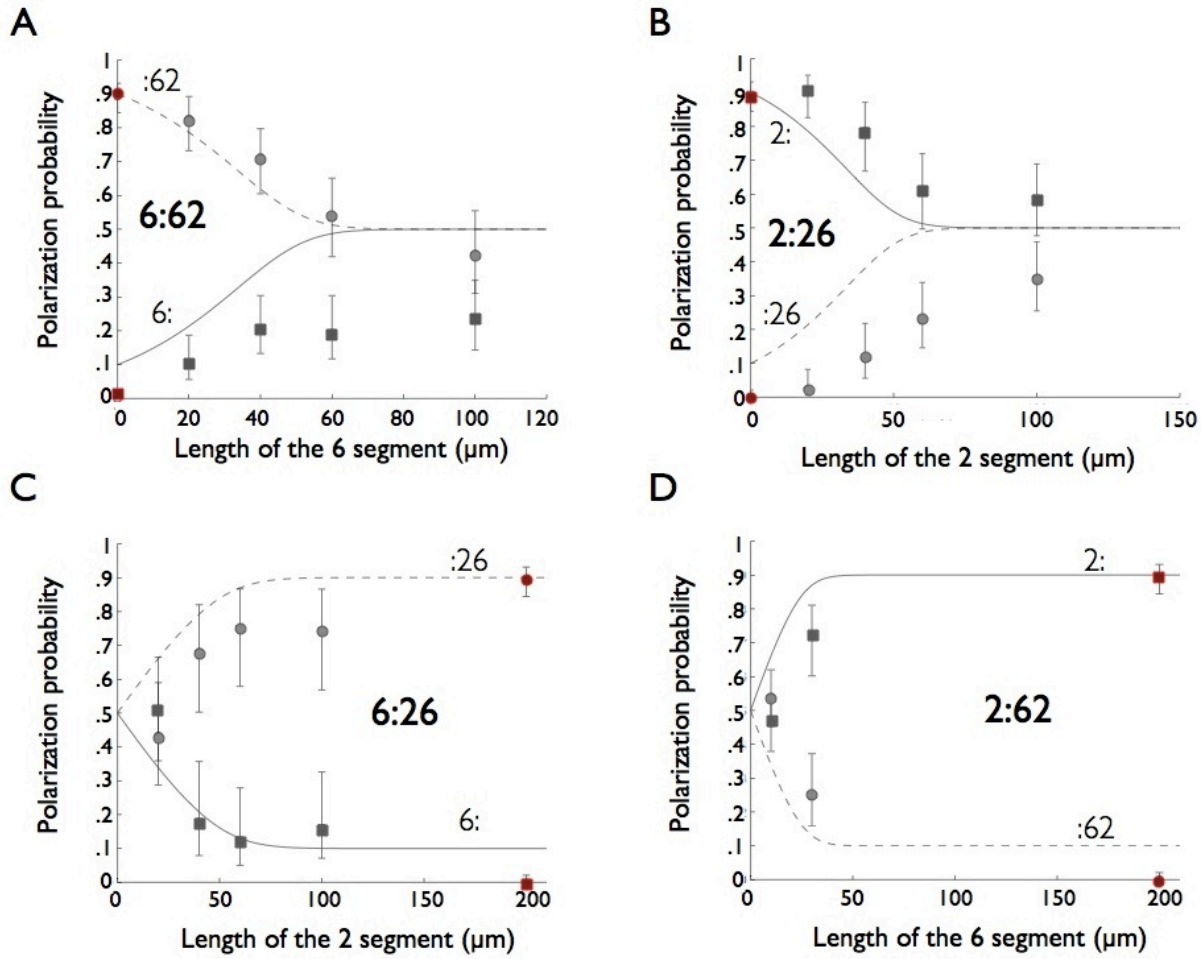


Fig.S4 – Polarization probabilities. The experimental points are obtained from a population of polarized cells identified from the presence of a Tau immunostaining on either neurite, plus the population of cells that present a strong length asymmetry (i.e. a ratio greater than 2 between the neurite lengths) without however showing a Tau labelling. The parameters of the model are the same as in Fig.5, 6, 7 and 8 in the main text.