## Supplementary movies

- S1: Kink walls with defects in the parameters range corresponding to the homogeneous isotropic state of the passive system: $r=-1, \tilde{\kappa}=10,|\tilde{\alpha}|=20, \lambda=1.5, L=50$. Most of the defect pairs annihilate and only a single $\pm 1 / 2$ pair remains unbound at long times (seeFig. 2a of the main text).
- S2: Kink walls in the parameters range corresponding to the homogeneous isotropic state of the passive system: $r=-1, \tilde{\kappa}=10,|\tilde{\alpha}|=30, \lambda=1.5, L=50$. All defect pairs annihilate and the final state is defect free (see Fig. 2b of the main text).
- S3: Formation of periodic bend textures in the region where the uniform nematic state is linearly unstable. The parameter values are: $r=2, \tilde{\kappa}=10,|\tilde{\alpha}|=3, \lambda=1.5, L=50$ (see Fig. 2c of the main text).
- S4: Kink walls with defects in the parameters range corresponding to the homogeneous nematic state of the passive system: $r=2, \tilde{\kappa}=10,|\tilde{\alpha}|=6, \lambda=1.5, L=50$. The final configuration is similar to that in S1.
- S5: Kink walls in the parameter range corresponding to the homogeneous nematic state of the passive system: $r=2, \tilde{\kappa}=10,|\tilde{\alpha}|=30, \lambda=1.5, L=50$. The final configuration is similar to that in S 2 (see Fig. 2e of the main text).
- S6: Turbulent state in the parameter range corresponding to the homogeneous nematic state of the passive system: $r=2, \tilde{\kappa}=10,|\tilde{\alpha}|=40, \lambda=1.5, L=50$. The movie shows defect proliferation with a non-zero steady state defect density (see Fig. 2e of the main text).
- S7: Transient anti-parallel alignment of $+1 / 2$ defects in a parameter regime where the homogeneous state is isotropic in absence of activity. The parameter values are: $r=-1, \tilde{\kappa}=10,|\tilde{\alpha}|=14, \lambda=$ $1.5, L=50$. We find rows of anti-parallel $+1 / 2$ defects at intermediate times, but the final steady state is defect free, with system-spanning kink walls (see Fig. 6 of the main text).
- S8: Turbulent state in a parameter range corresponding to the homogeneous isotropic state of the passive system: $r=-1, \tilde{\kappa}=10,|\tilde{\alpha}|=40, \lambda=1.5, L=50$. The final configuration is qualitatively similar to the one found in S6.

