**Supplementary data**

**Synthesis, TD-DFT, and Optical Properties Study of a Chromeno-Quinoline (Acceptor) and Mirror-Less Laser Action Enabled by Energy Transfer From a Conjugated-Polymer (Donor)**

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**Characterization data of 5(a-e)**

**1. 8*H*-Benzo[5,6]chromeno[4,3-*b*]quinoline (5a)**

Pale yellow solid; mp. 146-148 ˚C; 1H NMR (CDCl3, 500 MHz): δH 5.31 (s, 2H), 7.23 (d, lH, *J*=8.0 Hz), 7.33-7.90 (m, 5H), 7.95-8.17 (m, 3H), 8.20 (d, 1H, *J*=8.5 Hz), 9.88 (d, 1H, *J*=8.0 Hz).



**2. 11-Methyl-8*H*-benzo[5,6]chromeno[4,3-*b*]quinoline (5b)**

Pale yellow solid; mp. 172-174 ˚C; 1H NMR (CDCl3, 500 MHz): δH 2.51 (s, 3H), 5.31 (s, 2H), 7.24 (d, 1H, *J*=8.0 Hz), 7.45 (t, 1H, *J*=7.5 Hz), 7.57–7.60 (m, 2H), 7.72 (t, 1H, *J*=8.0 Hz), 7.85–7.89 (m, 3H), 8.15 (d, 1H, *J*=8.5 Hz), 9.89 (d, 1H, *J*=8.5 Hz).



**3. 11-Methoxy-8*H*-benzo[5,6]chromeno[4,3-*b*]quinoline (5c)**

Pale yellow solid; mp. 163-165 ˚C; 1H NMR (CDCl3, 500 MHz): δH 3.94 (s, 3H), 5.30 (s, 2H), 7.23 (d, 1H, *J*=7.5 Hz), 7.42–7.61 (m, 3H), 7.75 (t, 1H, *J*=7.5 Hz), 7.87–7.92 (m, 3H), 8.22 (d, 1H, *J*=8.5 Hz), 9.91 (d, 1H, *J*=8.0 Hz).



**4. 11-Chloro-8*H*-benzo[5,6]chromeno[4,3-*b*]quinoline (5d)**

Pale yellow solid; mp. 207-209 ˚C; 1H NMR (CDCl3, 500 MHz): δH 5.29 (s, 2H), 7.20 (d, 1H, *J*=8.0 Hz), 7.38 (t, 1H, *J*=7.5 Hz), 7.66-7.92 (m, 6H), 8.13 (d, 1H, *J*=8.0 Hz), 9.92 (d, 1H, *J*=8.5 Hz).



**5. 11-Bromo-8*H*-benzo[5,6]chromeno[4,3-*b*]quinoline (5e)**

Pale yellow solid; mp. 202-204 ˚C; 1H NMR (CDCl3, 500 MHz): δH 5.27 (s, 2H), 7.18 (d, 1H, *J*=8.0 Hz), 7.37 (t, 1H, *J*=7.5 Hz), 7.64 (t, 1H, *J*=7.5 Hz), 7.78-7.90 (m, 5H), 8.08 (d, 1H, *J*=8.5 Hz), 9.85 (d, 1H, *J*=8.0 Hz).



**Discussion on reaction optimization for the synthesis of Chromenoquinolines, 5**

An examination of the synthesized O-propargylated naphthaldehyde with substituted anilines was performed under different catalysts to optimize the reaction conditions. Initially, the reaction was performed in acetonitrile with 10 mol% of BF3.OEt2 as the catalyst. The reaction afforded the chromenoquinoline only in traces. Then, other Lewis acids such as InCl3 and La(OTf)3 were employed to improve the yield of the product as these Lewis acids are more reactive than BF3.OEt2. The reactions with 10 mol% of InCl3afforded the product in 31% yield while La(OTf)3 afforded the product in 35% yield. Among them, we have chosen La(OTf)3 as it is stable under moisture and available for a low cost. As the transition metal catalysts activates the terminal alkyne; we combined the transition metal catalyst with the Lewis acid to promote the reaction rate and yield. We have chosen Cu(I) for this purpose as it is readily available besides its properties, such as non-toxicity and insensitiveness to air. The reaction of O-propargylated naphthaldehyde and anilines with 10 mol% each CuI and La(OTf)3 in acetonitrile under reflux for 5 hours afforded the products, 5(a-e) in good yields (80-92%).



**Fig. S1** absorption spectra of PFO-co-pX in toluene for different concentrations ranging from 30 μM to 200 mM



**Fig. S2** fluorescence spectra of PFO-co-pX in toluene for different concentrations ranging from 30 μM to 200 mM