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<td>Chen, Ye</td>
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RESETTABLE ELECTRONIC LOGIC GATES BASED ON MULTI-MODULATED MOLECULAR TRANSPORT JUNCTIONS

Motivation
What & Why?
Molecular electronics has generated much excitement among scientists due to the huge size-reduction of electronics by molecular-level control of properties. Molecules are the smallest stable structures imaginable to exceed the foreseen limits of small-scale conventional silicon integrated circuits. Molecular Transport Junction contains molecules attached to metal electrodes at each end to act as an electronic component. Ru-dithienylethylene (Ru-DTE) molecule is employed due to its bi-conductive functionality upon photochromic isomerization.

Methodology
How?

I: Build up the electrodes
II: Implant the molecular logic gates

Findings
Horizon!
- Upon irradiation of UV light, visible light or electrochemical redox reactions, Ru-DTE molecules transfer between open(1o) and closed(1c) states
- The combination of UV and E treatments act as an 'OR' gate
- Resettable and repeatable operation can be achieved by altering the conditions (reset by visible light)

References
Chem. Sci. 2012, 3, 3113-3118
Roadmap for chip makers at Intel’s Annual Investment Meeting in 2012:

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Supervisor: Asst Prof Chen Xiaodong
Collaborators: Mr Meng Fanben, Ms Liu Yuanjun

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