Listing S1: A flat Kappa model of the chemotaxis switch ring. This is part of a larger model by Vincent Danos, reproduced with permission from the author.

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## 8 flips (aka conformational change)
### 4 P flips without CheY - note that P(f~0) is favoured 2/1
'flip 000'  P(f~0,y!1),P(x!1,f~0,y!2,s),P(x!2,f~0) -> P(f~0,y!1),P(x!1,f~1,y!2,s),P(x!2,f~0)@1
'bflip 000' P(f~0,y!1),P(x!1,f~1,y!2,s),P(x!2,f~0) -> P(f~0,y!1),P(x!1,f~0,y!2,s),P(x!2,f~0)@200

'flip 100'  P(f~1,y!1),P(x!1,f~0,y!2,s),P(x!2,f~0) -> P(f~1,y!1),P(x!1,f~1,y!2,s),P(x!2,f~0)@1
'bflip 100' P(f~1,y!1),P(x!1,f~1,y!2,s),P(x!2,f~0) -> P(f~1,y!1),P(x!1,f~0,y!2,s),P(x!2,f~0)@2

'flip 001'  P(f~0,y!1),P(x!1,f~0,y!2,s),P(x!2,f~1) -> P(f~0,y!1),P(x!1,f~1,y!2,s),P(x!2,f~1)@1
'bflip 001' P(f~0,y!1),P(x!1,f~1,y!2,s),P(x!2,f~1) -> P(f~0,y!1),P(x!1,f~0,y!2,s),P(x!2,f~1)@2

'flip 101'  P(f~1,y!1),P(x!1,f~0,y!2,s),P(x!2,f~1) -> P(f~1,y!1),P(x!1,f~1,y!2,s),P(x!2,f~1)@100
'bflip 101' P(f~1,y!1),P(x!1,f~1,y!2,s),P(x!2,f~1) -> P(f~1,y!1),P(x!1,f~0,y!2,s),P(x!2,f~1)@2

### 4 P flips with CheY - note that all forwards are multiplied by 10
'flip 000b'  P(f~0,y!1),P(x!1,f~0,y!2,s!_),P(x!2,f~0) -> P(f~0,y!1),P(x!1,f~1,y!2,s!_),P(x!2,f~0)
    @10
'bflip 000b' P(f~0,y!1),P(x!1,f~1,y!2,s!_),P(x!2,f~0) -> P(f~0,y!1),P(x!1,f~0,y!2,s!_),P(x!2,f~0)
    @200

'flip 100b'  P(f~1,y!1),P(x!1,f~0,y!2,s!_),P(x!2,f~0) -> P(f~1,y!1),P(x!1,f~1,y!2,s!_),P(x!2,f~0)
    @10
'bflip 100b' P(f~1,y!1),P(x!1,f~1,y!2,s!_),P(x!2,f~0) -> P(f~1,y!1),P(x!1,f~0,y!2,s!_),P(x!2,f~0)@2

'flip 001b'  P(f~0,y!1),P(x!1,f~0,y!2,s!_),P(x!2,f~1) -> P(f~0,y!1),P(x!1,f~1,y!2,s!_),P(x!2,f~1)
    @10
'bflip 001b' P(f~0,y!1),P(x!1,f~1,y!2,s!_),P(x!2,f~1) -> P(f~0,y!1),P(x!1,f~0,y!2,s!_),P(x!2,f~1)@2

'flip 101b'  P(f~1,y!1),P(x!1,f~0,y!2,s!_),P(x!2,f~1) -> P(f~1,y!1),P(x!1,f~1,y!2,s!_),P(x!2,f~1)
    @1000
'bflip 101b' P(f~1,y!1),P(x!1,f~1,y!2,s!_),P(x!2,f~1) -> P(f~1,y!1),P(x!1,f~0,y!2,s!_),P(x!2,f~1)@2
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