bad cell growth rate is 0.01

bad cells spawn 20 cell

bad cells spawn
range x (600)-300
range y (600)-300

good cell growth rate is 0.001
spawn 20 cell at
x = (600)-300
y = (600)-300

rate get signal of bad cells

```
rate ( get_signal(AZ)*1) : {a := a+1};
   rate ( get_signal(SNVc)*0.5 ) : {a := a+1};
   rate ( get_signal(JSTP)*4 ) : {a := a+1};
   rate ( get_signal(CAT)*2) : {a := a+1};
   rate ( get_signal(Pfiran)*10) : {a := a+1};
     a > 10 : {die();}
```

rate get signal of good cells

```
rate ( get_signal(AZ)*2) : {a := a+1};
   rate ( get_signal(SNVc)*0.3 ) : {a := a+1};
   rate ( get_signal(JSTP)*4 ) : {a := a+1};
   rate ( get_signal(CAT)*1) : {a := a+1};
   rate ( get_signal(Pfiran)*11) : {a := a+1};


   a > 10 : {die();}
```

JSTP kills good cells
//drugs
AZ := signal(1,0.1);
SNVc := signal(2,0.2);
JSTP := signal(2,0.01);
CAT := signal(1,0.05);
Pfiran := signal(1,0.07);

Vaccine Types	Diffusion rate (out of 5)	Kill good cells	Kill bad cells	Area
AZ	++	+++	+++	++
SNVc	++	++	+++	++
JSTP	+++++	+++++ //kill all good cells	+++++ //kill all bad cells	+++++
CAT	++++	+++	++++	+++
Pfiran	+++	+++	+++	++

Vaccine	Kill good cells	Kill bad cells
AZ	2	1
SNVc	0.3	0.5
JSTP	4	4
CAT	1	2
Pfiran	11	10

Chemotaxis.gro

2 modes : walk and spin

```
program p() := {

  set ( "ecoli_growth_rate", 0.01 );
  m1 := 0;
  m2 := 0;
  t := 0;
  mode := 0;

  t > 0.25 : { // sampling at time 0.25
    t := 0,
    m1 := m2,
    m2 := get_signal(bad_signal)
  }

  mode = 0 : { run ( 8 ) } // walk at speed (8 steps)
  mode = 1 : { tumble ( 800 ) } // turn around  // spin
  mode = 2 : { run (10) }
```

```
  mode = 0 & m2 < m1 & rate ( 0.5 ) : { mode := 1 } // It is walking
  mode = 0 & m2 > m1 & rate ( 0.01 ) : { mode := 1 } // rate() 0 - inf ->  prob that it would be
true? prob 0.01 that it would be true

  mode = 1 & rate ( 0.01 ) : { mode := 0 }

  true : { t := t + dt }

};

Idea 1:
while true:
# find bad cell
get_signal(bad_signal)
        move // mode 1 & mode 2
        program p()
if bad_signal > threshold :
        then emit the vaccine
```

first design