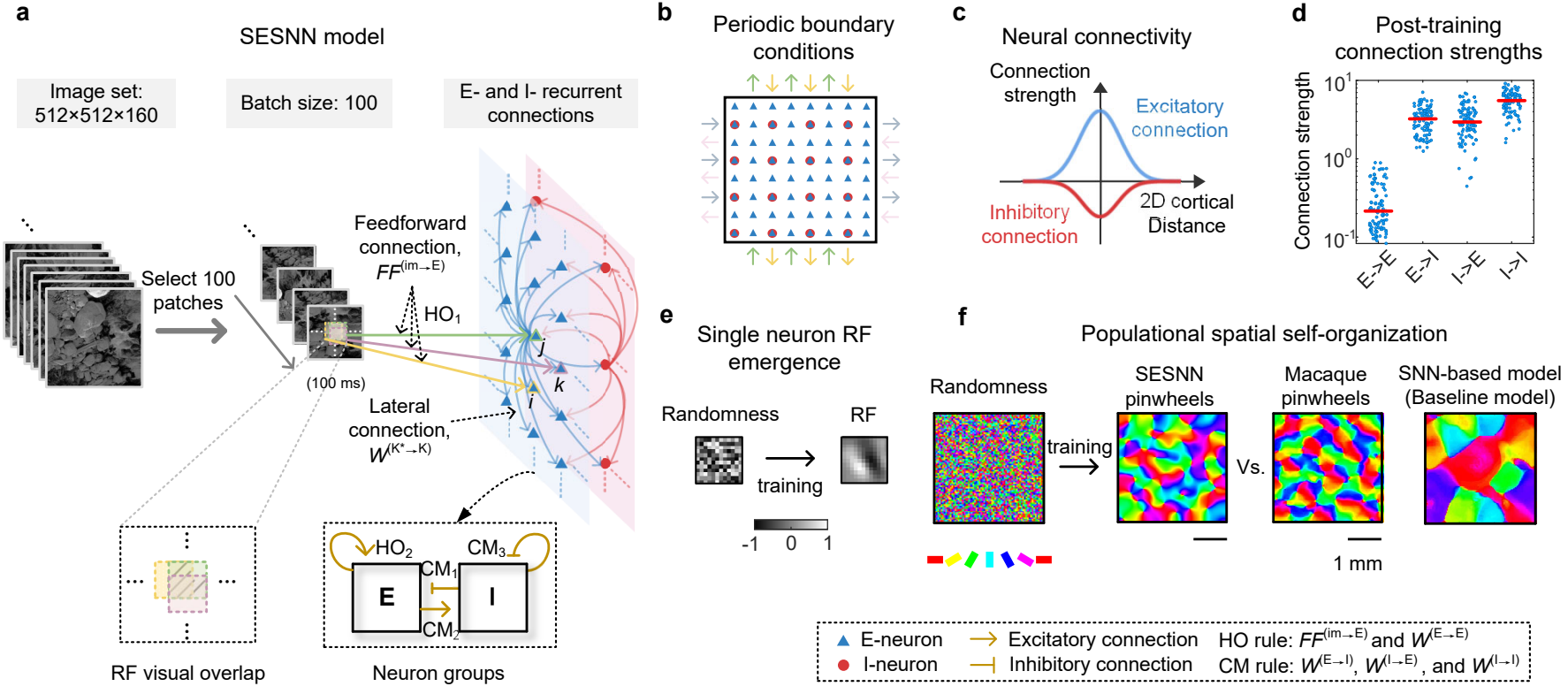
a
SESNN model
Image set: 512×512×160
Batch size: 100
E- and I- recurrent connections
Select 100 patches
(100 ms)
Feedforward connection, $FF^{(im\to E)}$
HO_1
Lateral connection, $W^{(K^*\to K)}$
j
k
i
HO_2
CM_3
CM_1
CM_2
E
I
RF visual overlap
Neuron groups
b
Periodic boundary conditions
c
Neural connectivity
Connection strength
Excitatory connection
Inhibitory connection
2D cortical Distance
d
Post-training connection strengths
Connection strength
10^1
10^0
10^{-1}
E->E
E->I
I->E
I->I
e
Single neuron RF emergence
Randomness
RF
training
-1
0
1
f
Populational spatial self-organization
Randomness
training
SESNN pinwheels
Vs.
Macaque pinwheels
SNN-based model (Baseline model)
1 mm
E-neuron
I-neuron
Excitatory connection
Inhibitory connection
HO rule: $FF^{(im\to E)}$ and $W^{(E\to E)}$
CM rule: $W^{(E\to I)}$, $W^{(I\to E)}$, and $W^{(I\to I)}$