

Local signaling by the EGF receptor

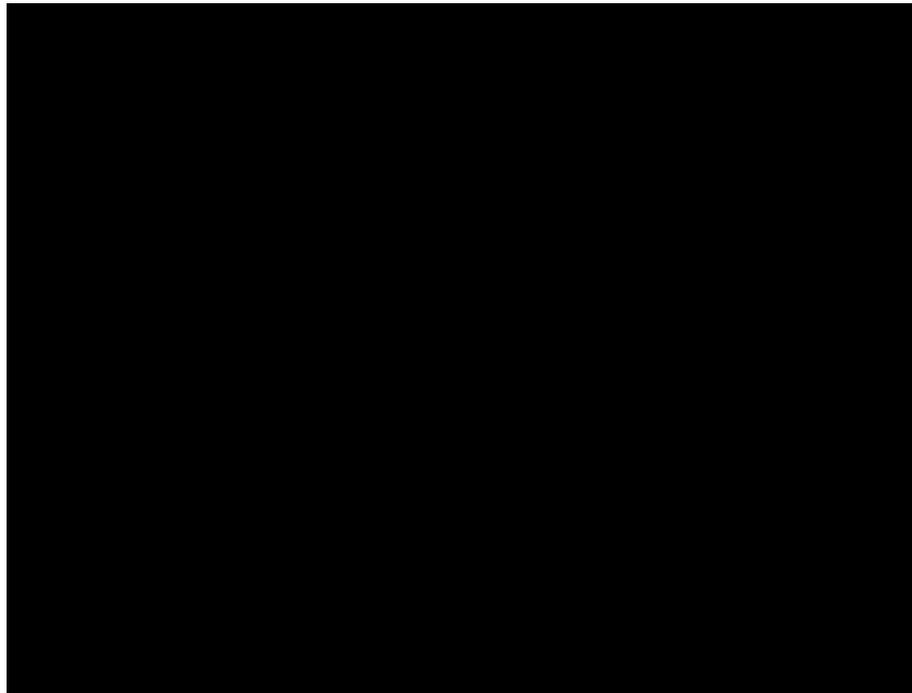
JCB,162:781-787

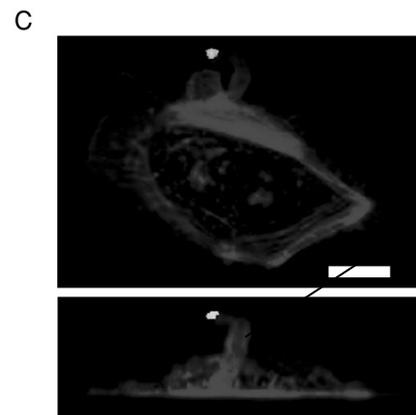
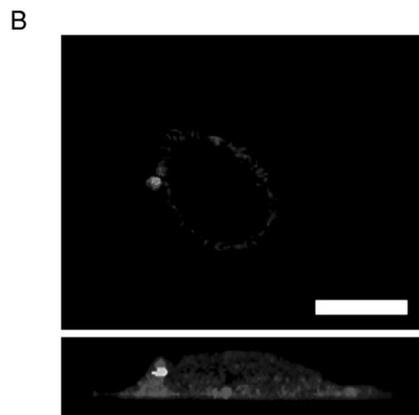
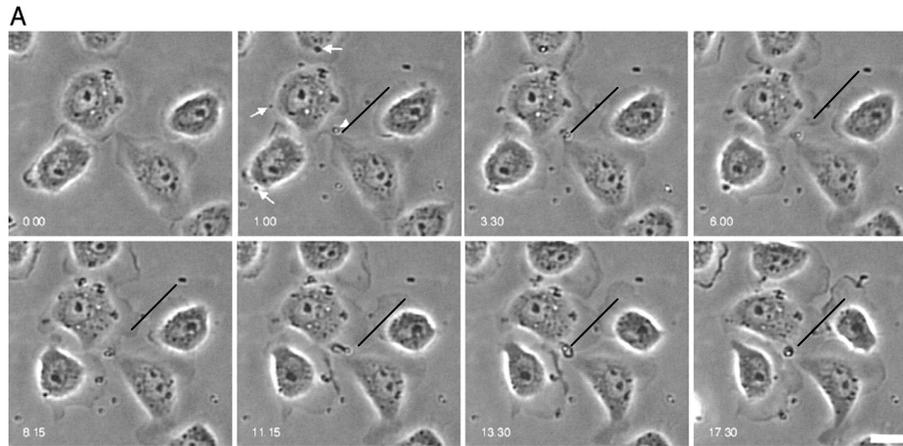
Presented by Liang, Dave

Background

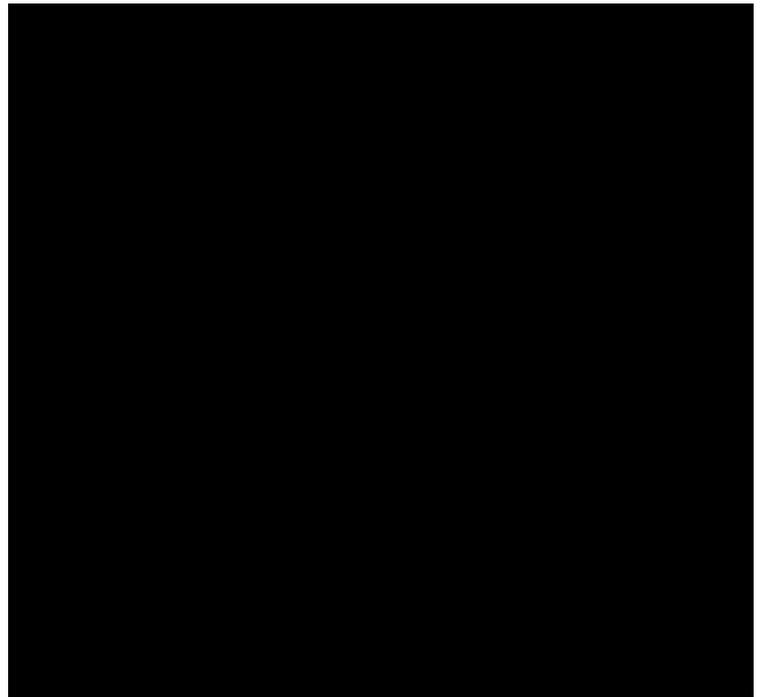
- Chemotactic responses
- Actin polymerization
- EGF & EGFR
- PI3K & rho-GTPase
- Localization

Responses to EGF-beads

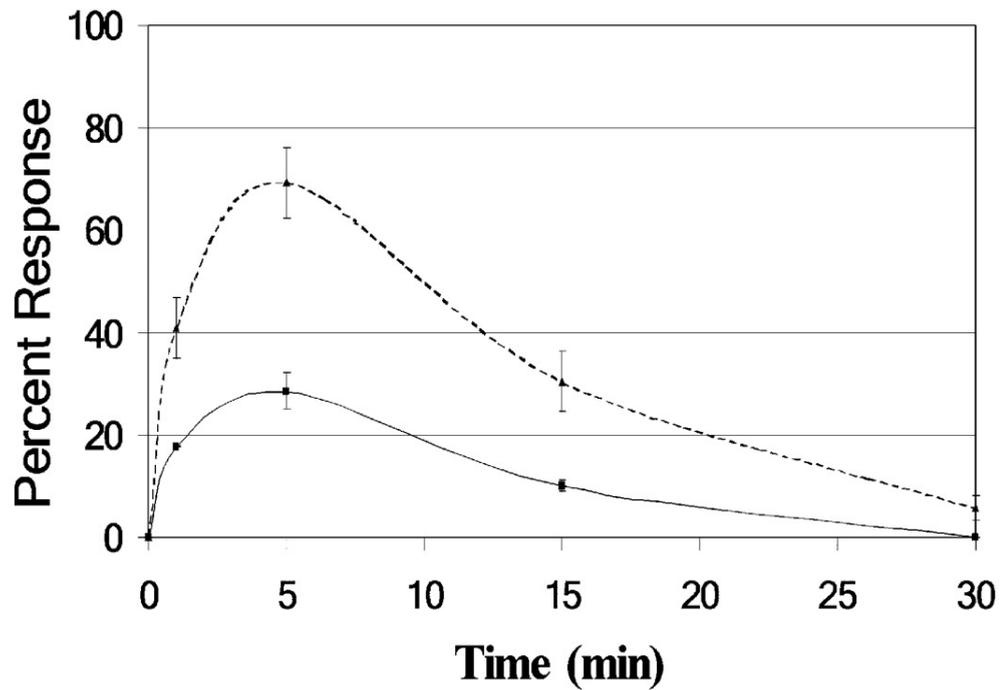




Use the magnet
to make the
beads suspend

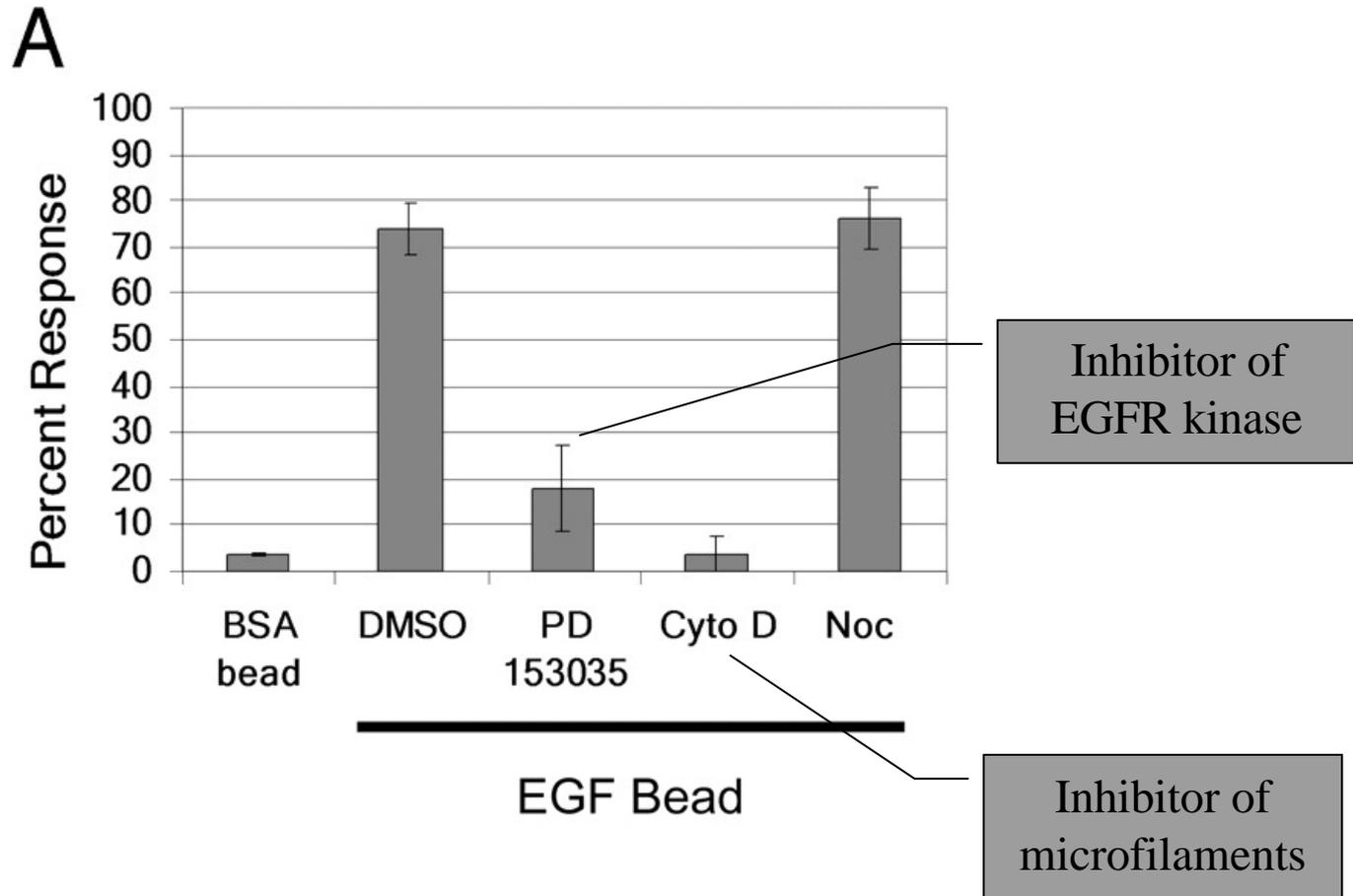


D

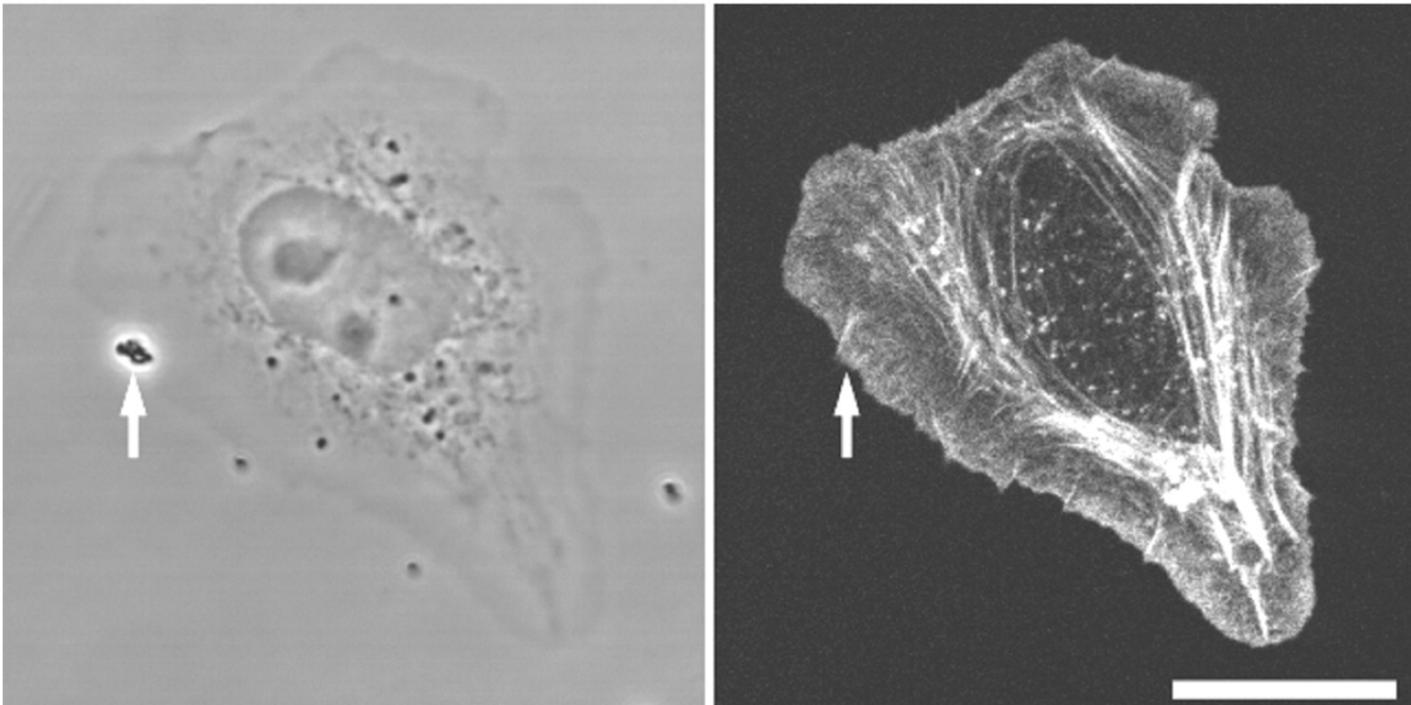


The peak response to the beads occurred 5 min after application of the beads.

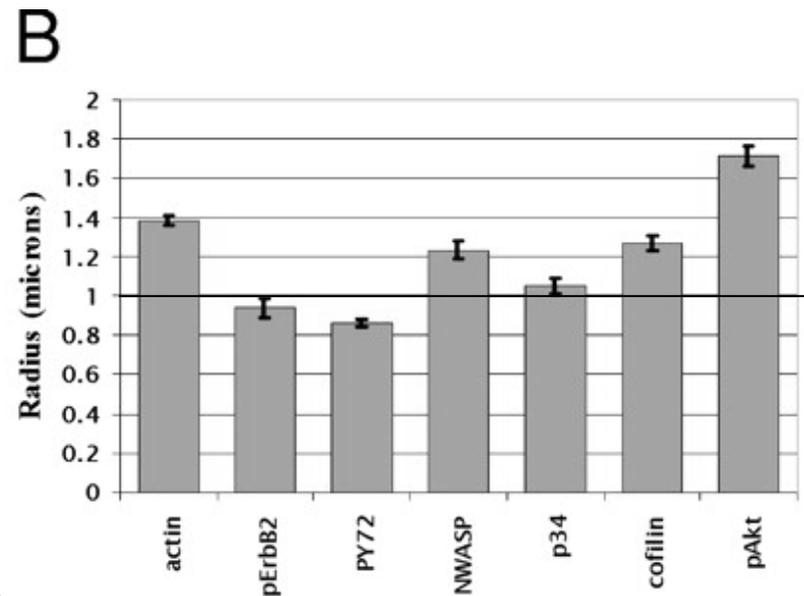
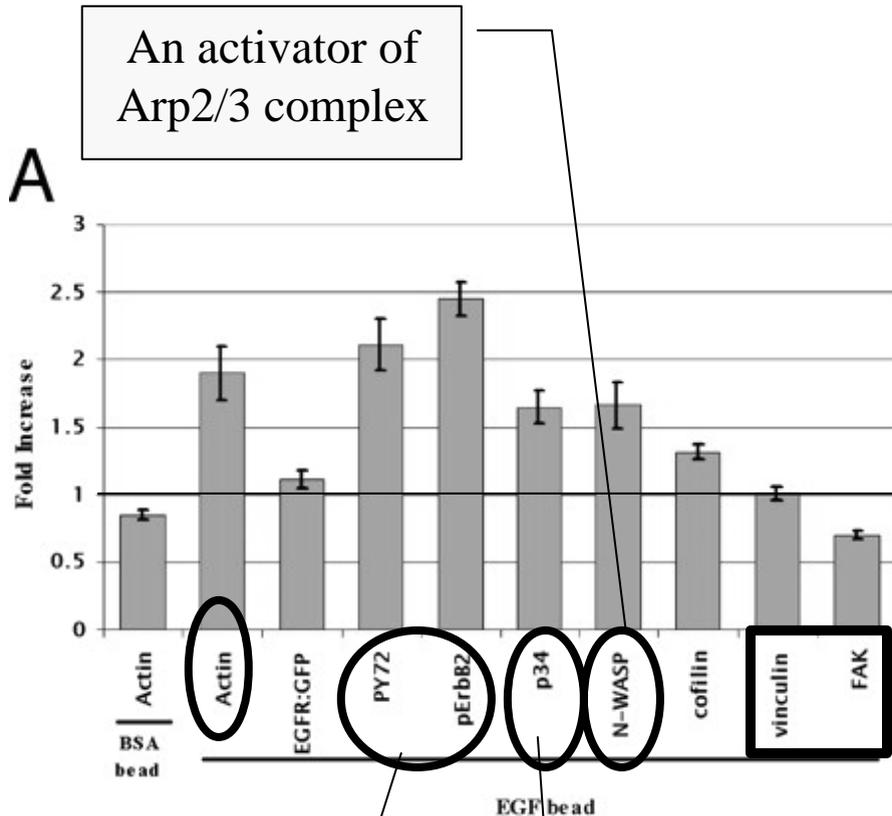
Beads responses depend on poly-Actin & EGFR kinase



B The soluble EGF blocked the beads' response.



Proteins around EGF-beads



An activator of Arp2/3 complex

Localized EGF responses

A subunit of Arp2/3 complex

Focal adhesion related proteins

C

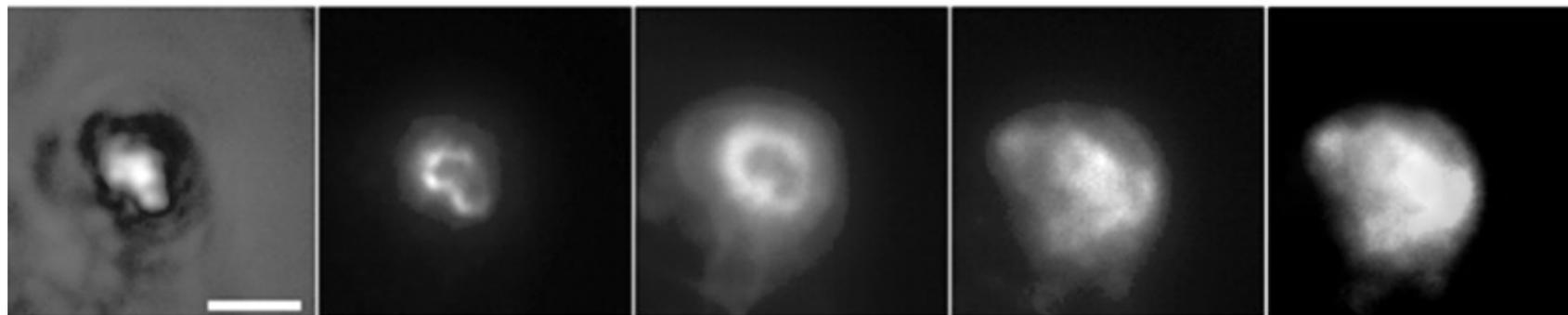
Phase

pTyr

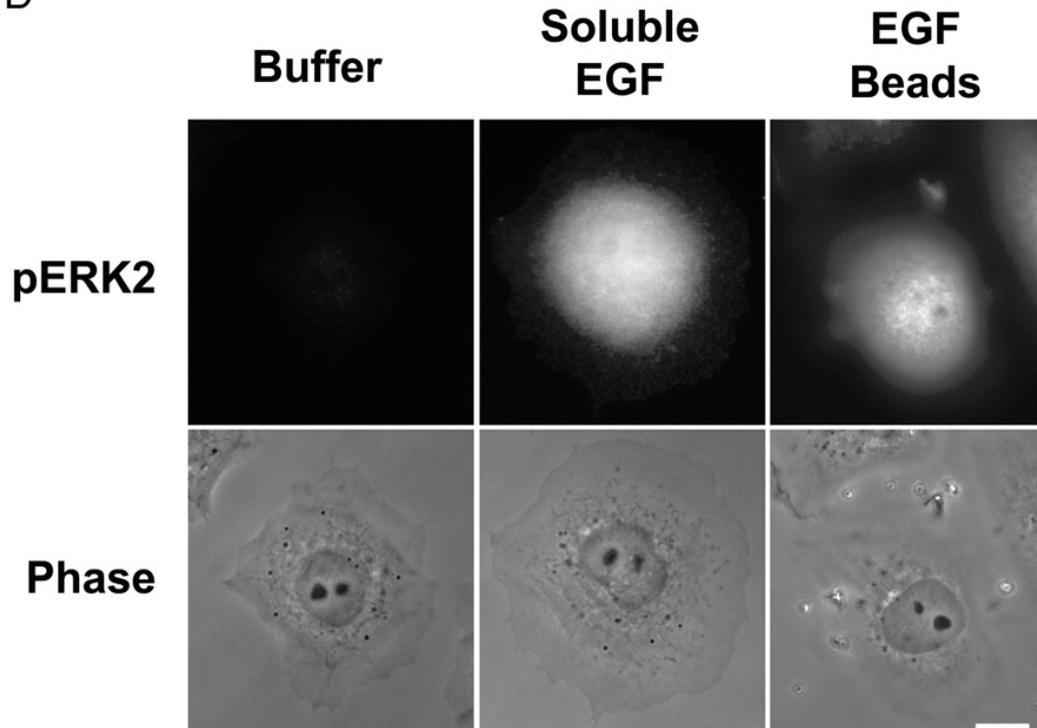
F-actin

pAkt

Merge



D

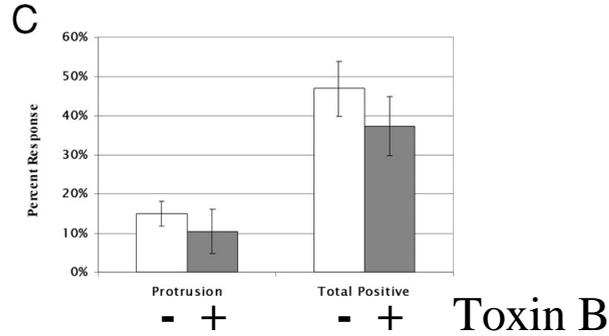
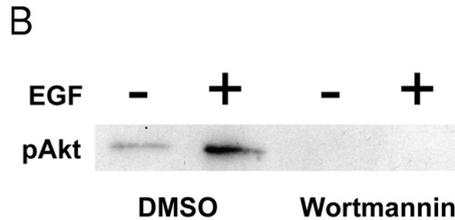
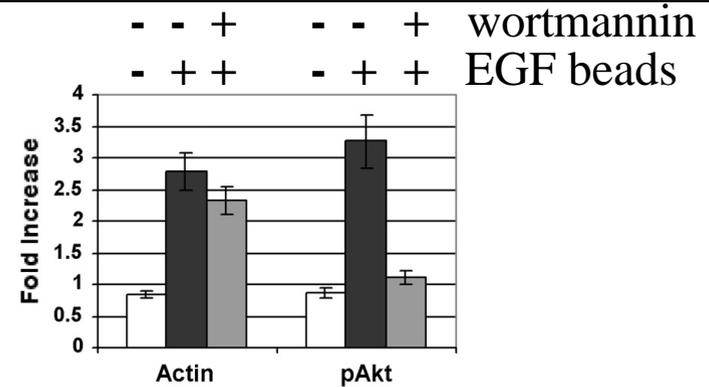
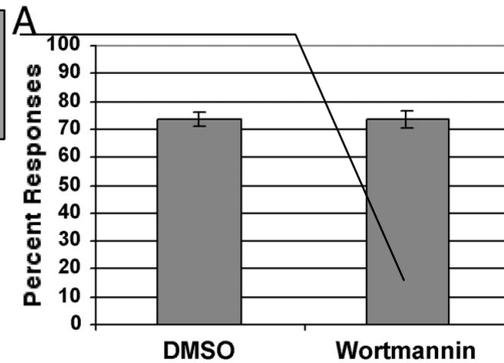


PhosphoErk was increased both at the bead and throughout the cell cytoplasm.

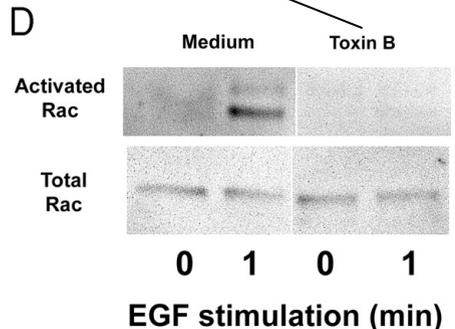
* MAPK/ERK or Ras/Raf/MEK/ERK signaling pathway influences the cell function.

Beads responses is PI3K & rho-GTPase independent

A PI3 kinase inhibitor



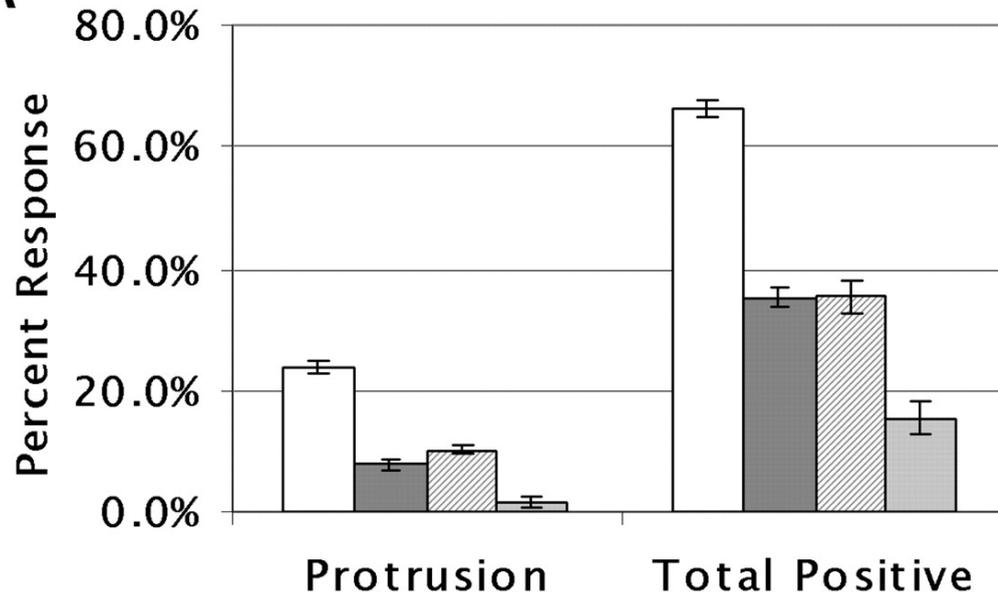
A potent inhibitor of Rho, Rac and Cdc42



* PI3-kinase/Akt signaling pathway

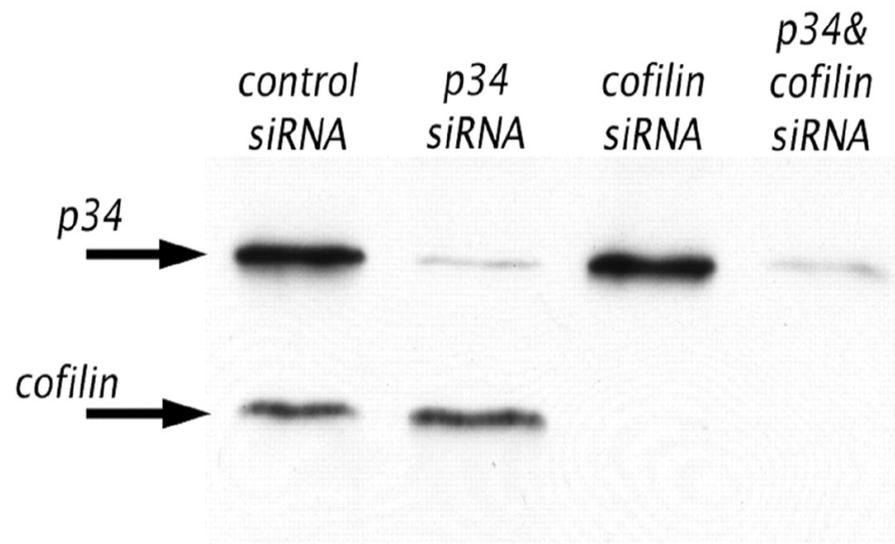
Arp2/3 & cofilin work for EGF-beads response

A



p34-siRNA:	-	+	-	+	-	+	-	+
cofilin-siRNA:	-	-	+	+	-	-	+	+

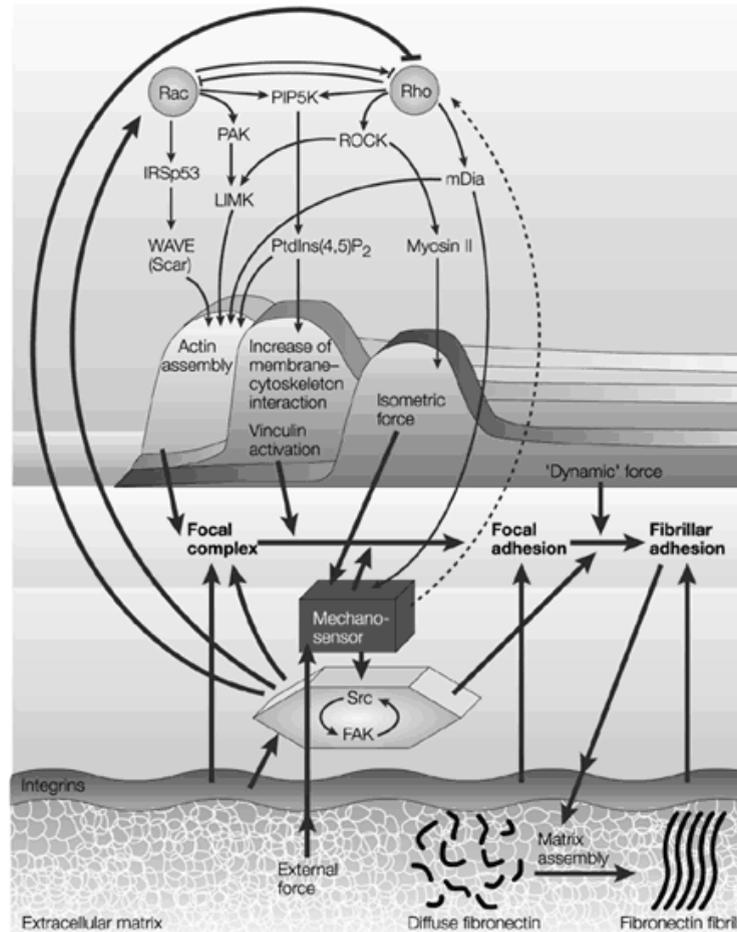
* Cofilin binds actin and assist in translocation of actin from the cytoplasm to the nucleus.



Conclusion

- Localized activation depends on the kinase activity of the EGFR and actin polymerization.
- PI3 kinase and rho family GTPase were not necessary for the localized actin polymerization.

Discussion



Nat Rev Mol Cell Bio, 2:79