Precision Medicine & Ion Channel Retreat 2018
Shunde, China

Ion Transporters in Glioma

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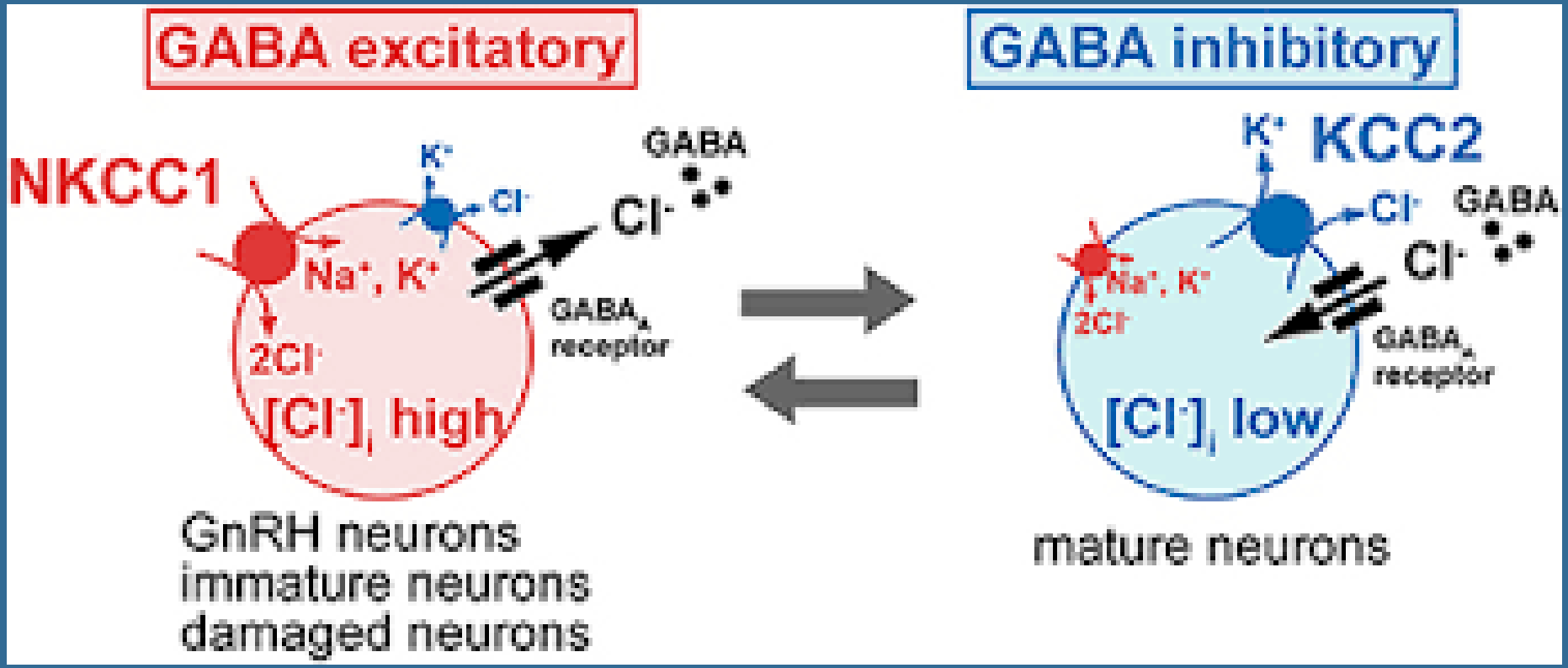
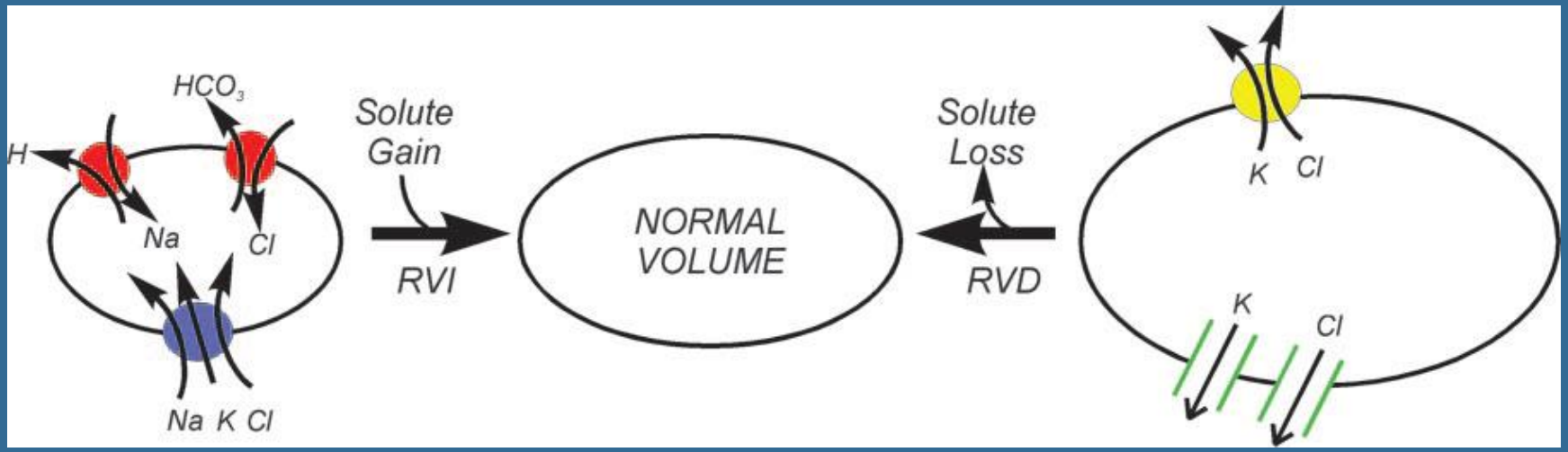
USA

Cl^-_i homeostasis and GABA function



Frontiers in Neuroscience. 2014

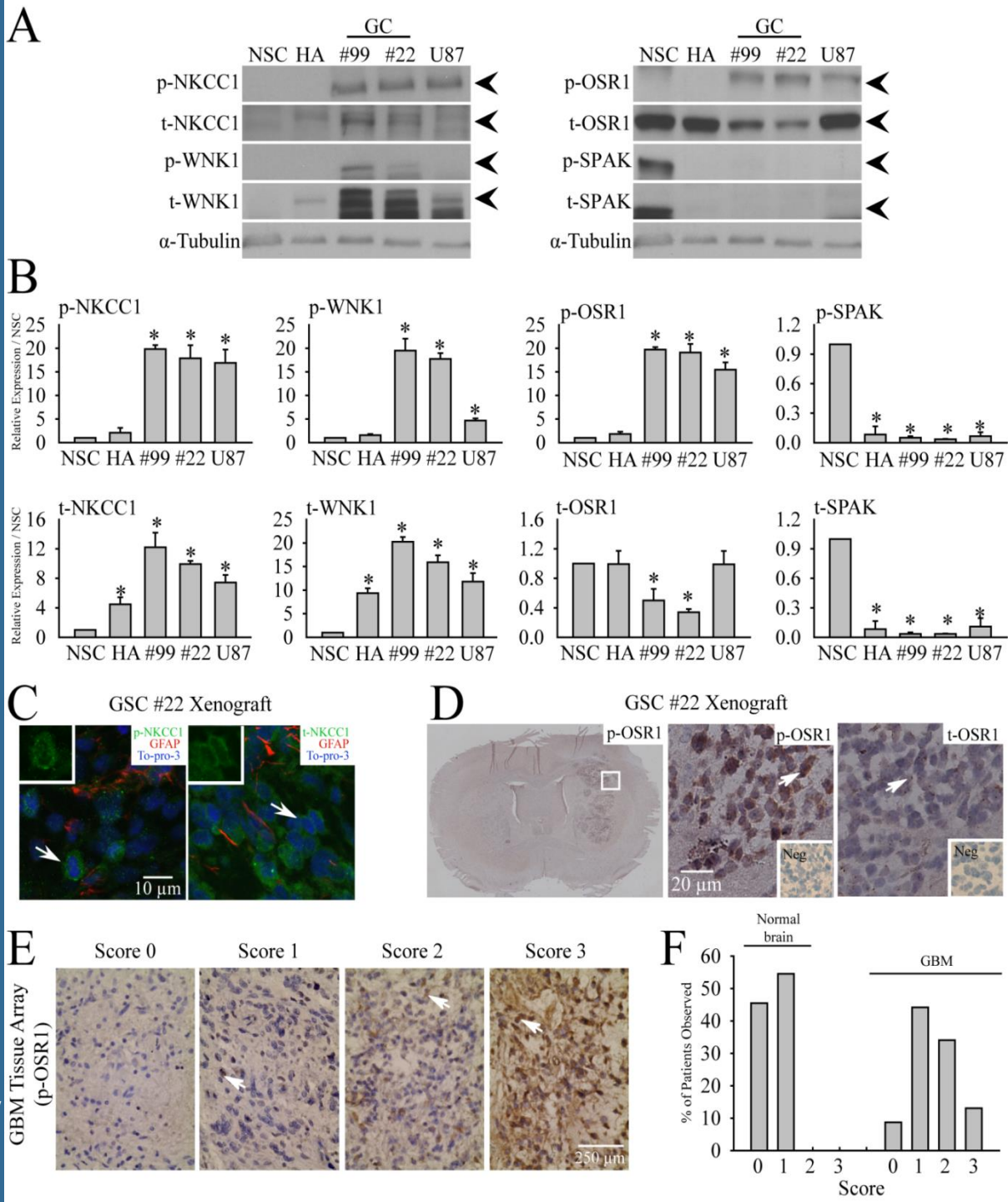
NKCC1 and NHE1 in Cell Volume Regulation



Volume regulatory electrolyte loss and accumulation is mediated by changes in the activity of membrane carriers and channels. Activation of these transport pathways occurs rapidly after the volume perturbation.

Kevin Strange, Advan Physiol Educ. 2004

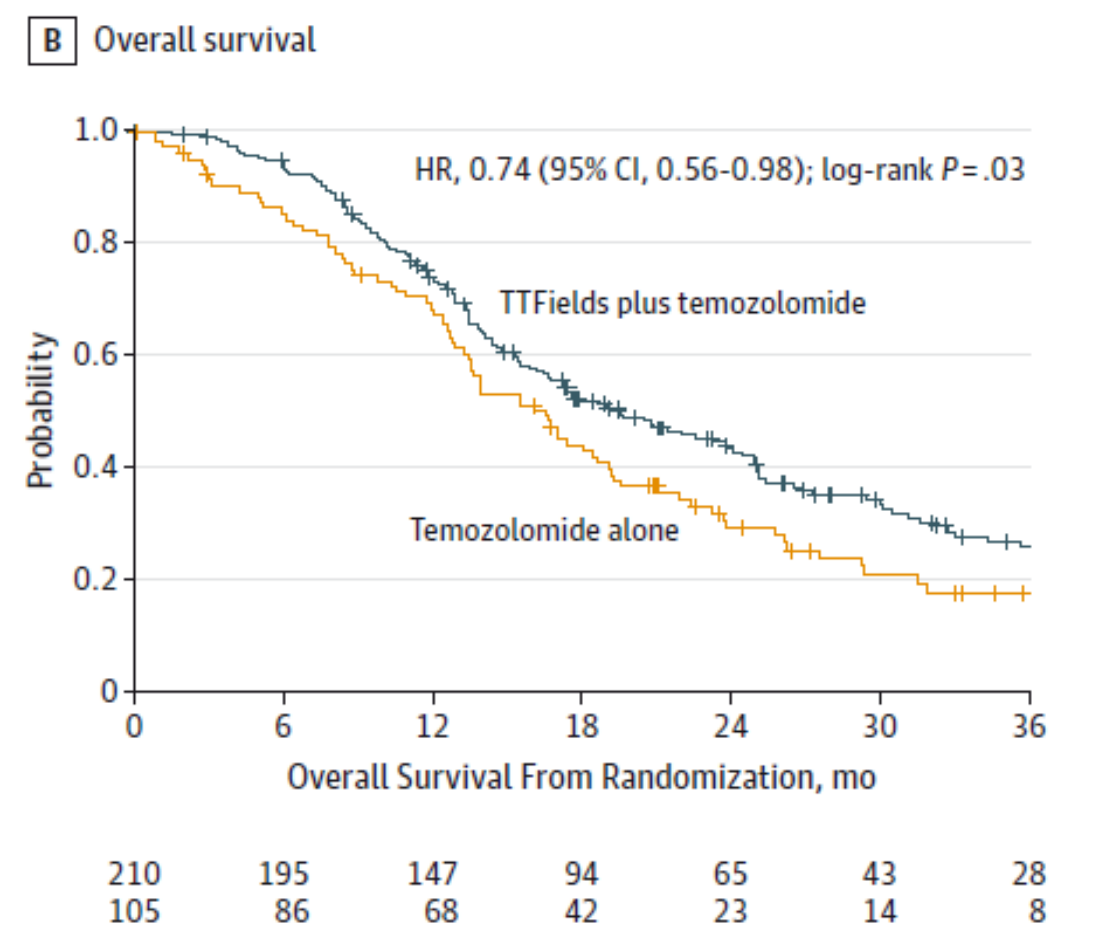
Expression of NKCC1 protein in GBM cells



Zhu et al., Molecular Cancer, 2014

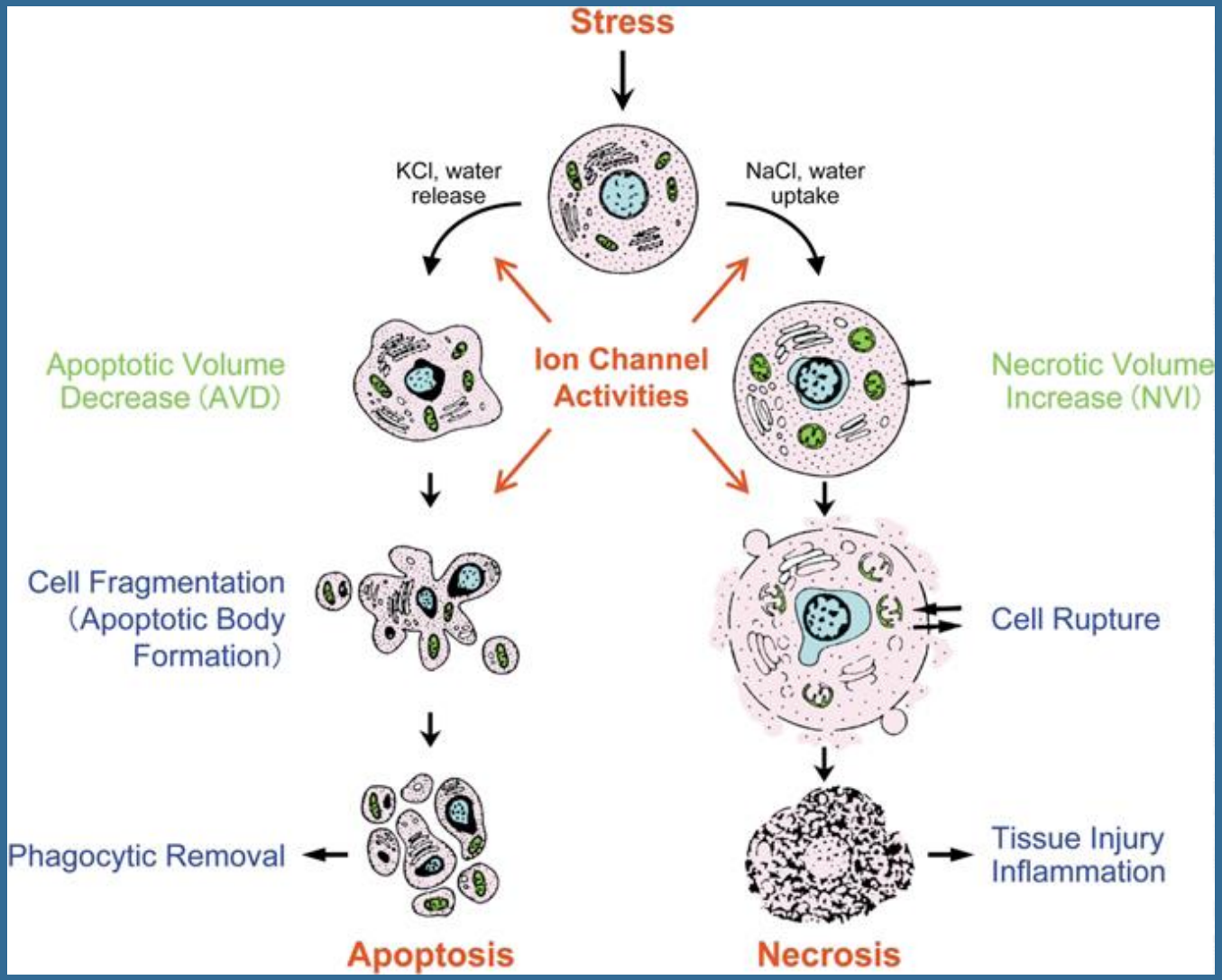
Glioblastoma management

Standards of treatment: Surgery with postoperative radiotherapy and concurrent chemotherapy with temozolomide (TMZ)



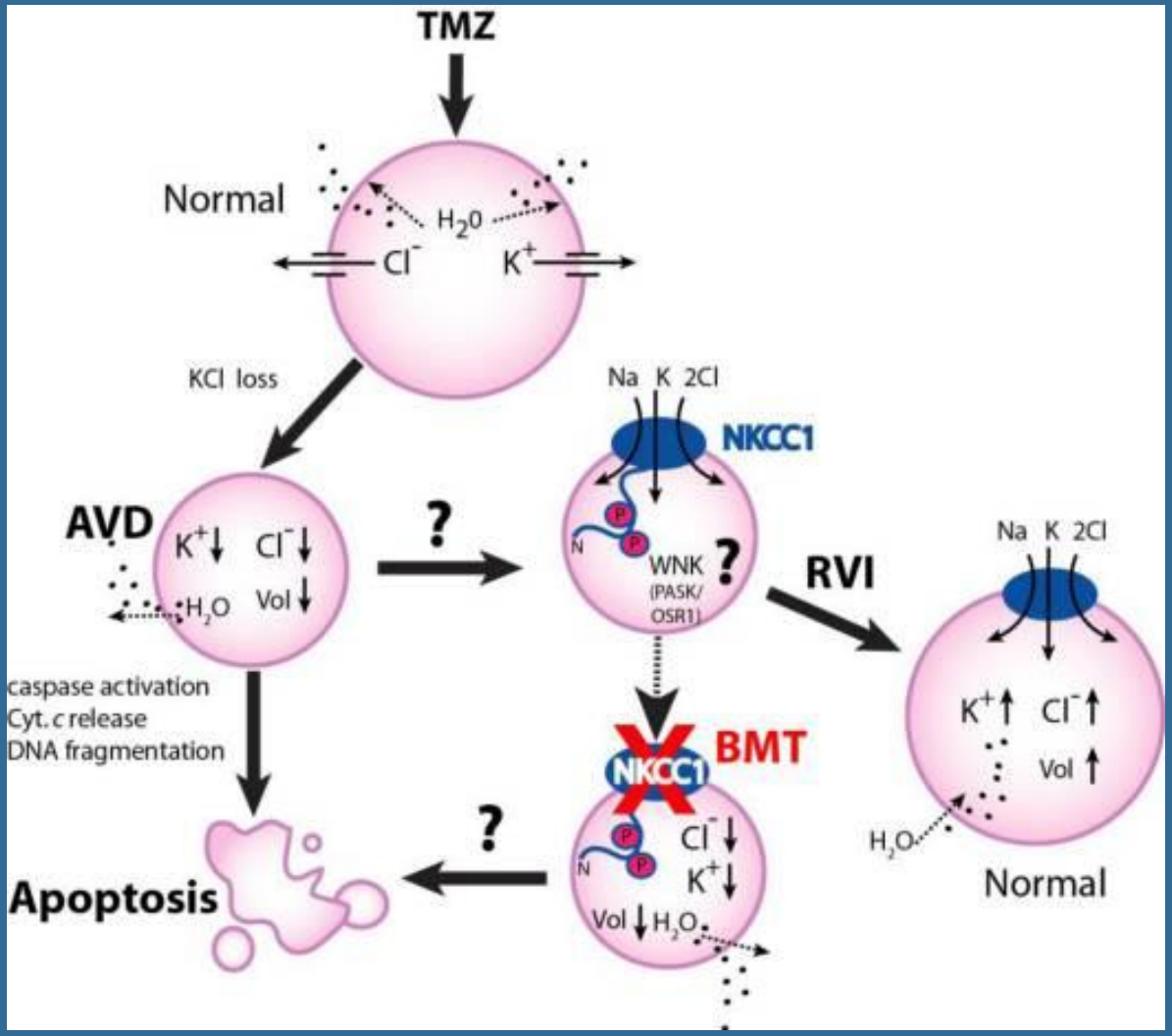
Stupp et al. JAMA. 2015

Roles of Ion Channels and Cell Volume Changes in Cell Death Processes



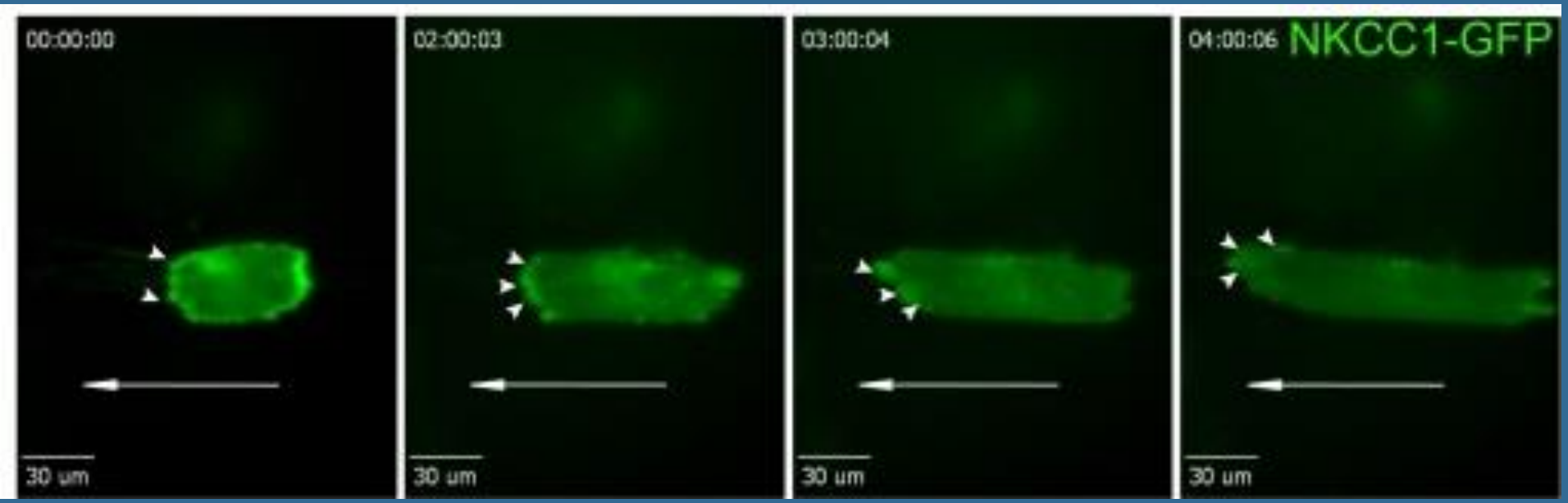
Okada et al, J. Membrane Biol. 209, 1–2 (2006)

Ion Transporters in Glioma Cell Volume Regulation



Algharabli, et al., 2012

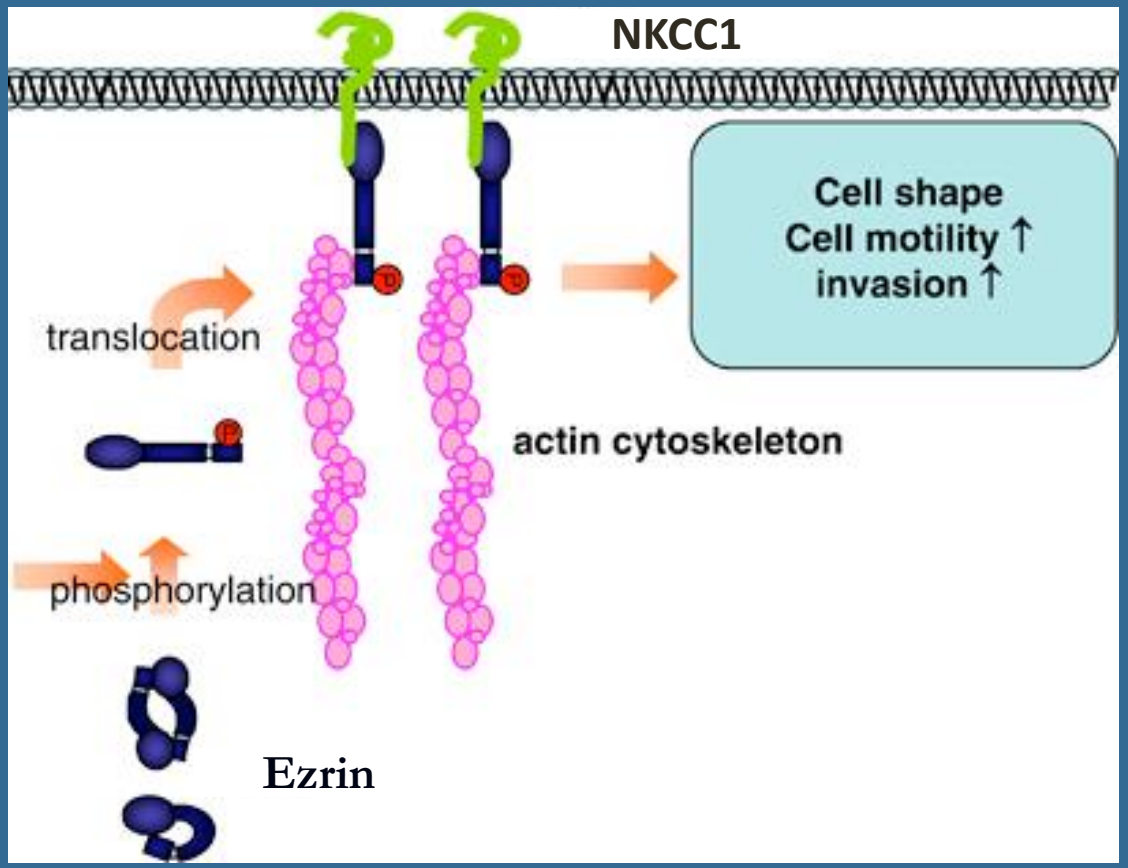
NKCC1 localized on the leading edge of GBM cells

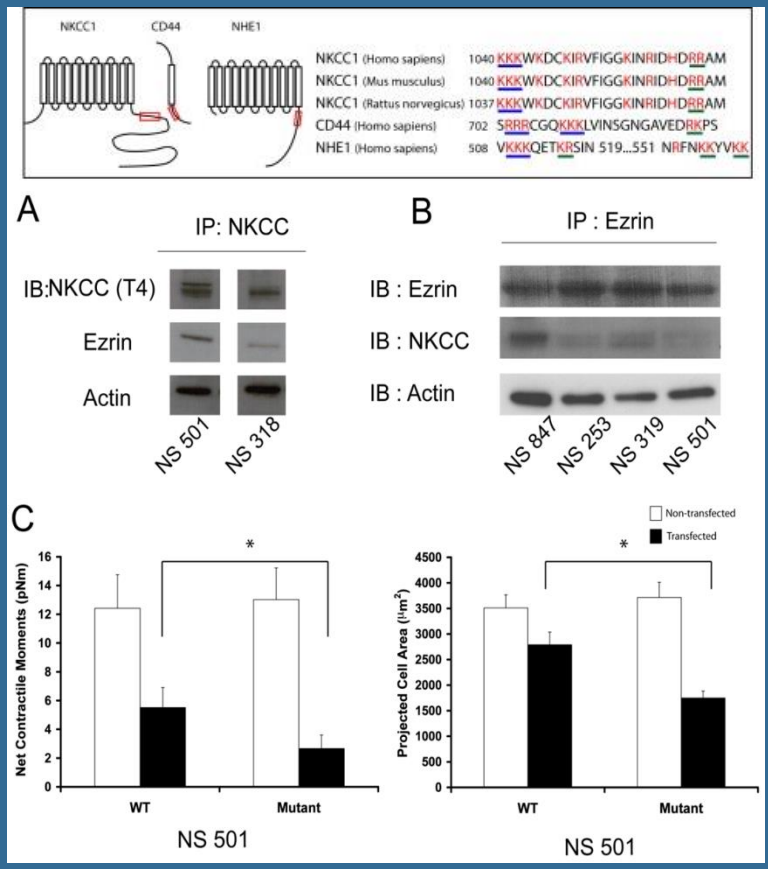


A glioma cell expressing NKCC1-GFP protein migrating on a nanopatterned substrate.

Hass et al. Can Res. 2010

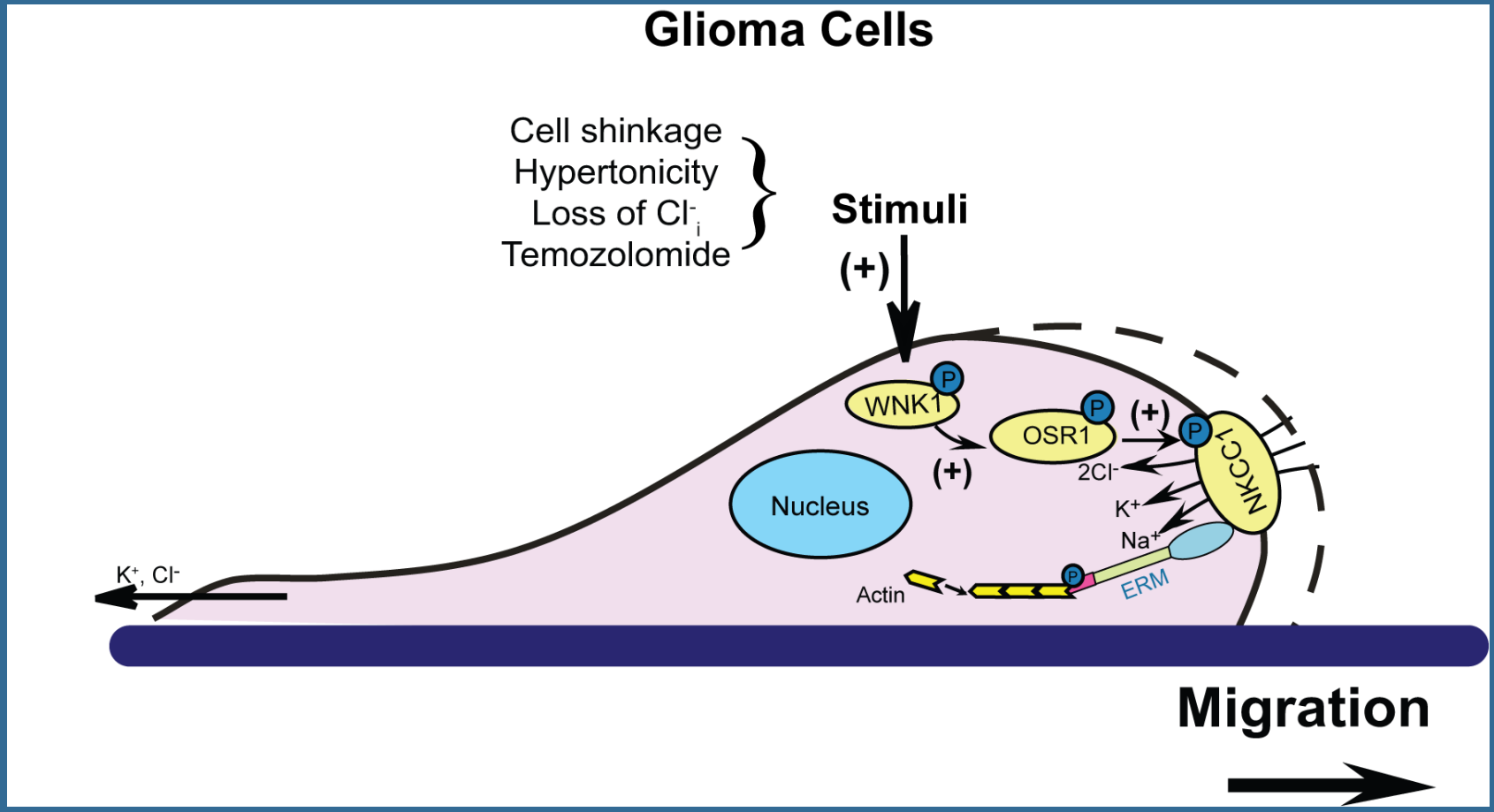
NKCC1 is associated with ERM protein complex in cell migration





Garzon-Muvdi et al. PLoS Biol. 2012

The WNK1-OSR1-NKCC1 signaling pathway in glioma migration



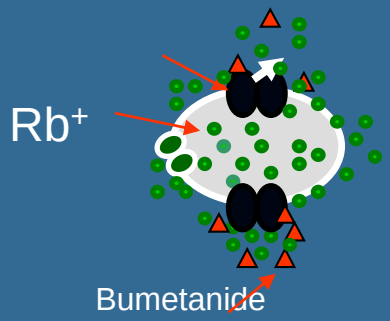
Zhu et al. Molecular Cancer, 2014

Measuring NKCC1 protein activity in mouse glioma cells via Rb^+ influx assay

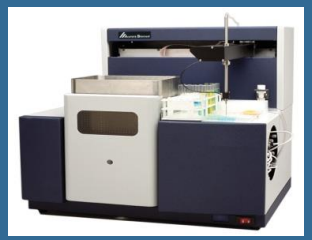
50,00 Cells/Well

24h

5 min for isotonic solution;
10 min for hypertonic solution, 37ºC



Lyse cells

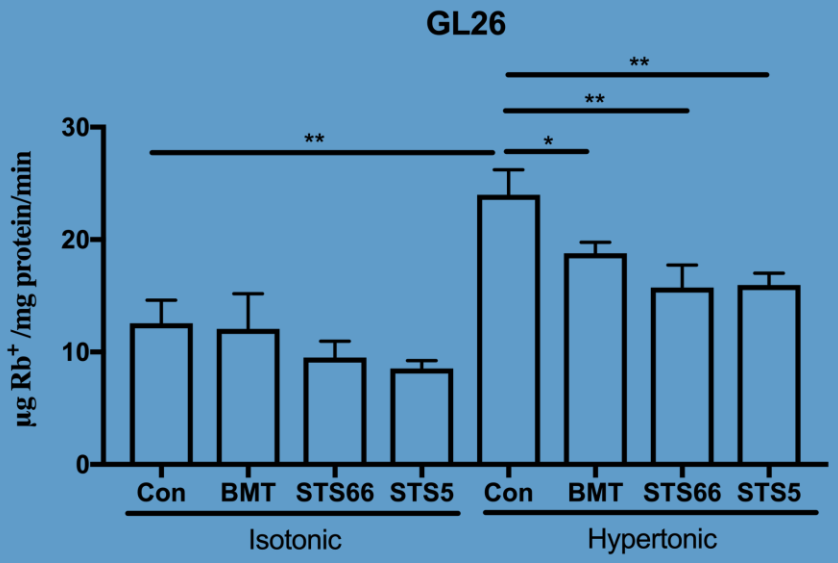


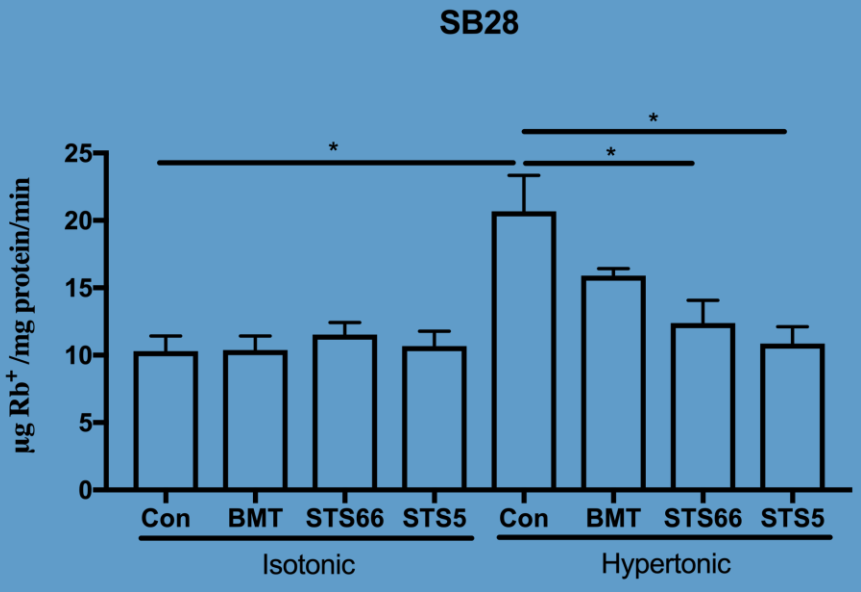
Aurora Instruments

ICR 8000

Luo et al., unpublished

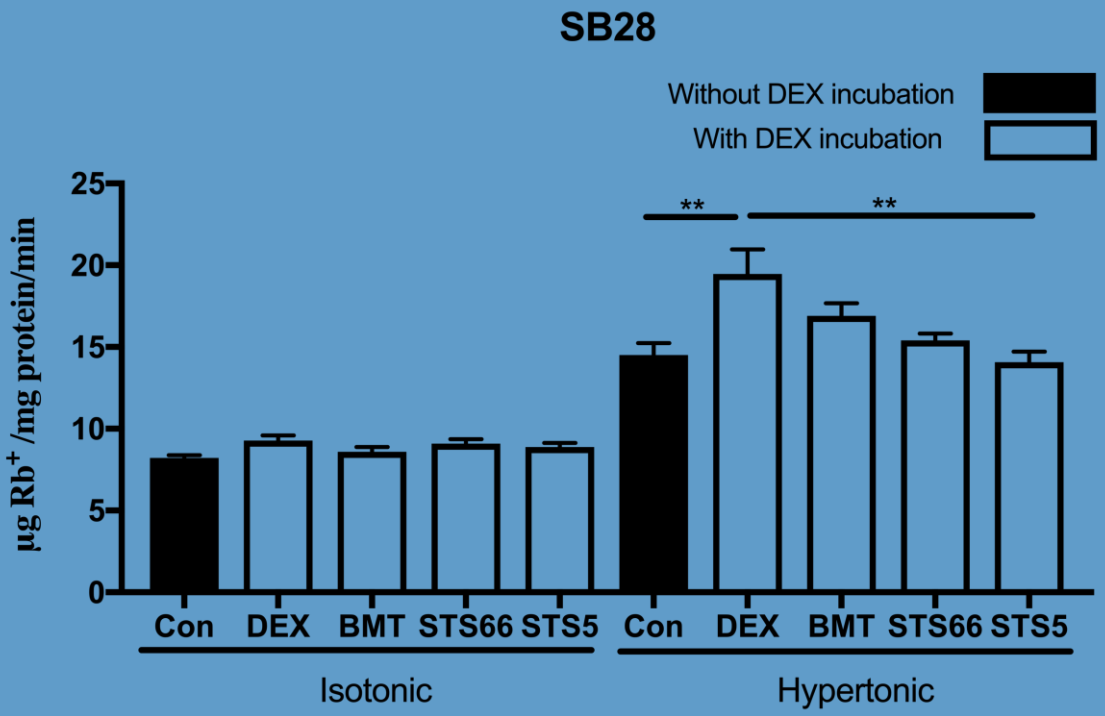
NKCC1-mediated Rb^+ uptake in glioma cells





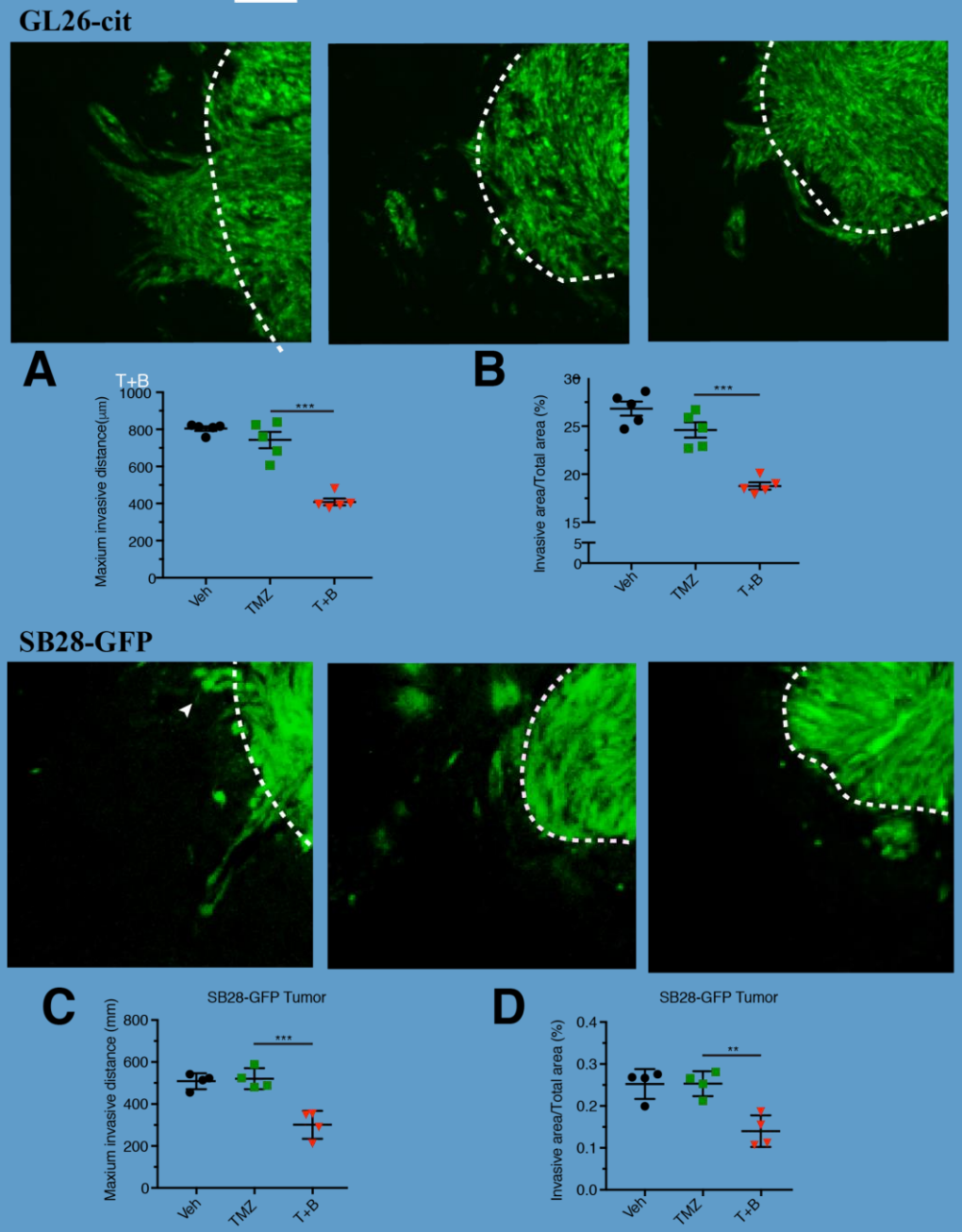
Luo et al., unpublished

NKCC1 activity in glioma is increased by dexamethasone (DEX)



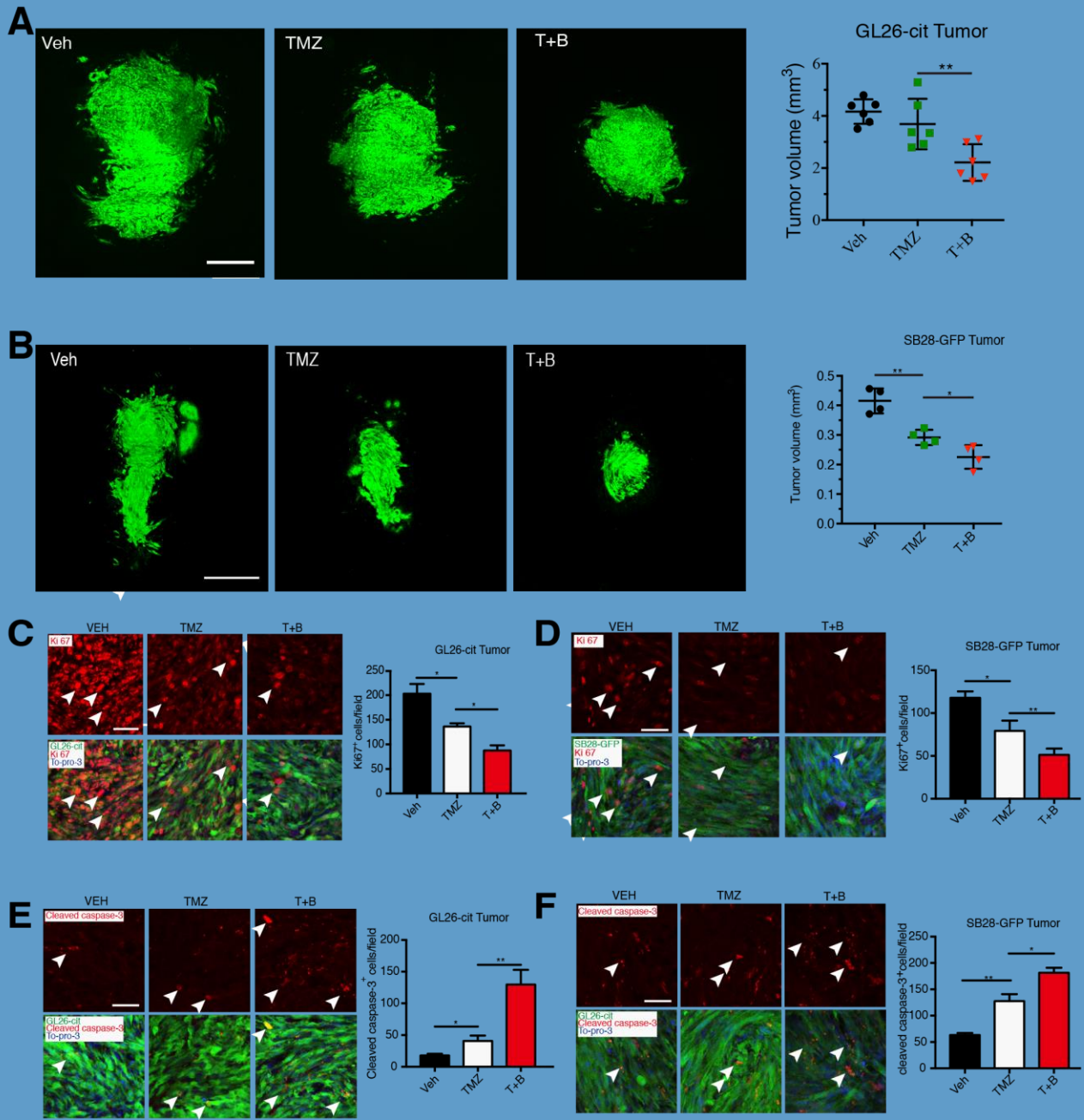
Luo et al., unpublished

Blocking NKCC1 protein reduces glioma invasiveness

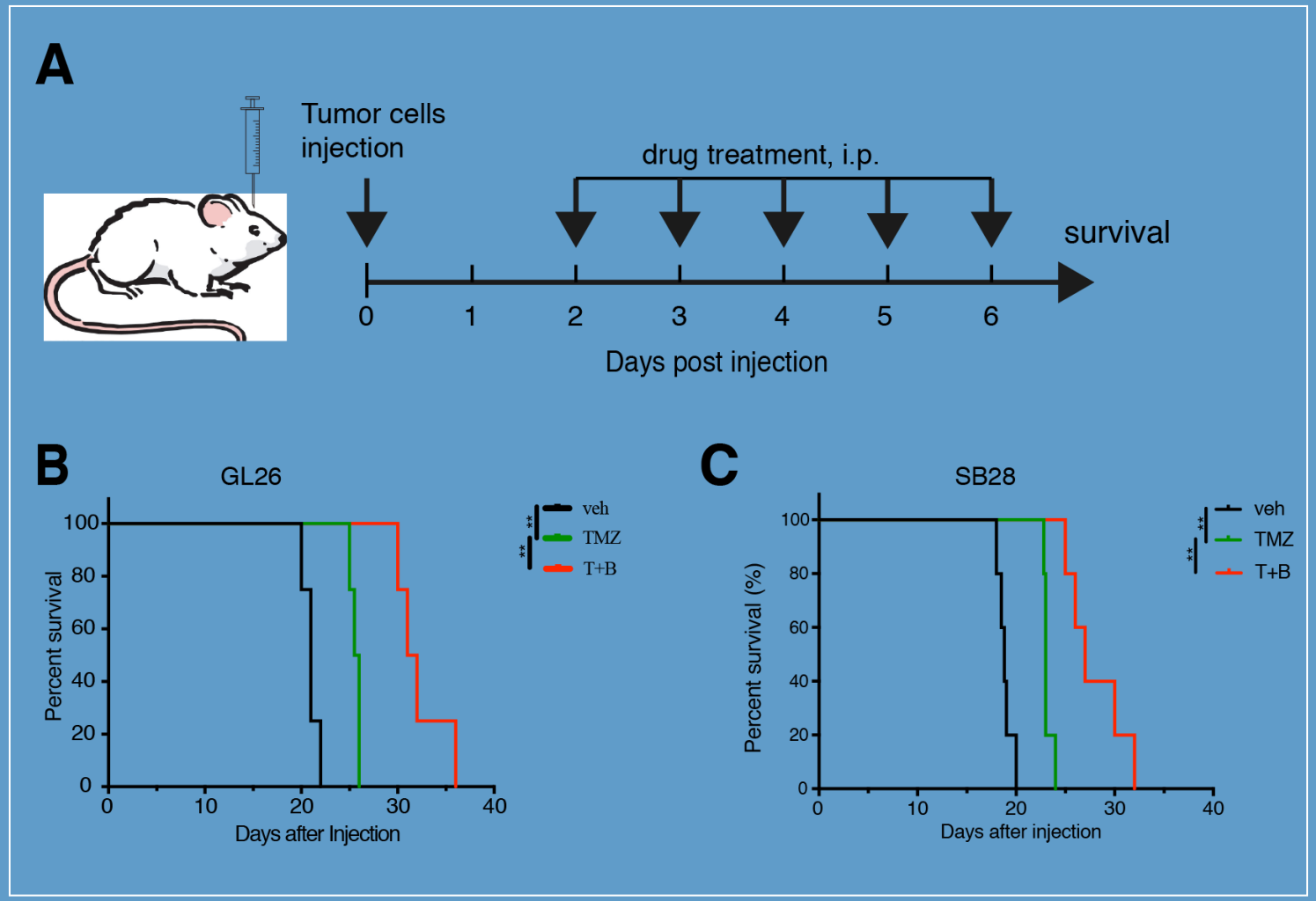


Guan et al., unpublished

Blocking NKCC1 activity reduces glioma volume



Combinatorial treatment with TMZ and bumetanide shifts animal survival curve



Guan et al., unpublished

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