Ataxia related protein sacsin knockout disrupts the intermediate filaments network in glial cells

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BACKGROUND

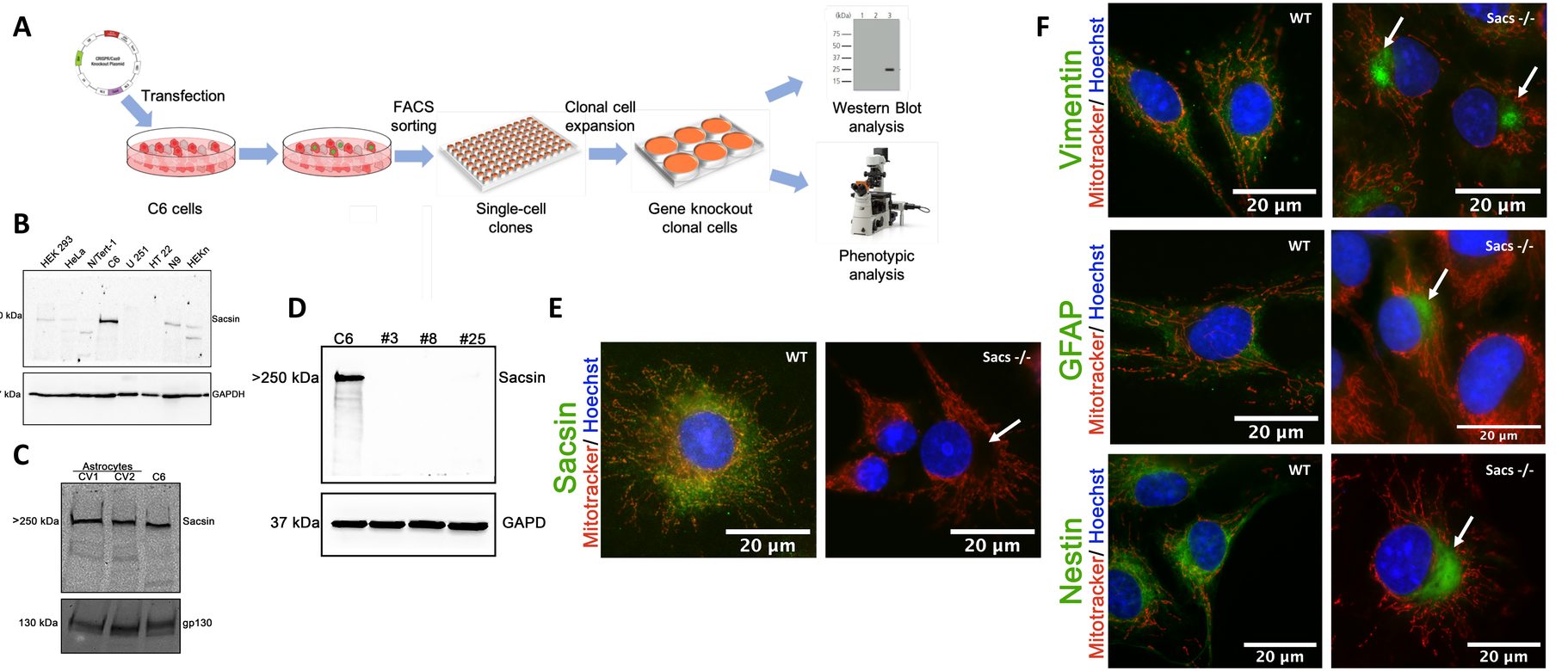
Autosomal recessive spastic ataxia of Charlevoix-Saguenay (ARSACS) is an early onset neurodegenerative disorder, characterized by progressive cerebellar ataxia, spasticity and motor sensory neuropathy.

ARSACS is caused by mutations in the *SACS* gene that lead to truncated or defective forms of the 520 kDa multidomain protein sacsin .

Sacsin function has been exclusively studied on neuronal cells, where it regulates mitochondrial function and distribution and takes part in the normal polymerization of neurofilaments and vimentin.

To determine the role of sacsin in glial cells, we deleted it from C6 rat glioma cell line by a CRISPR/Cas9 approach (Fig. A). We are currently characterizing the sacsin knockout cell line.

SACSIN KNOCKOUT IN C6 RAT GLIOMA CELLS



CONCLUSIONS

- Astrocytes express sacsin (Fig. C).
- Mitochondrial network is absent in the juxtanuclear area in C6 sacsin KO cells (Fig. E).
- The intermediate filaments vimentin, GFAP and vimentin accumulate in the juxtanuclear area in sacsin KO cells (Fig. F).