Curcumin Promotes Hematoma Resolution Following Intracerebral Hemorrhage via a CD36-dependent Mechanism

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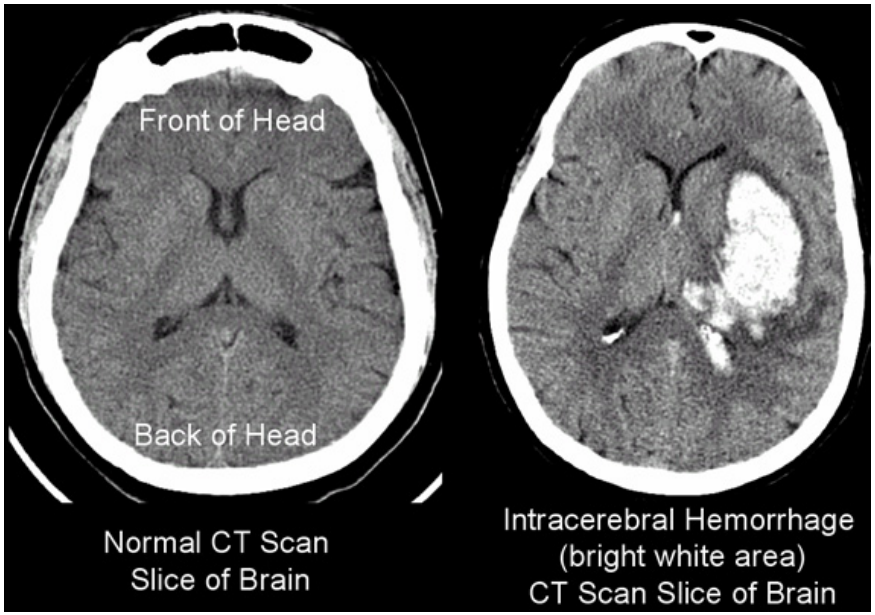
Intracerebral Hemorrhage (ICH)

- 15% of strokes – about 120,000 each year
- Caused by hypertension or amyloid angiopathy
- 40% mortality rate in the first month
- Least treatable form of stroke



Intracerebral Hemorrhage (ICH)

- Hematoma volume is an independent predictor of mortality and long-term deficits
- However, surgical intervention remains limited
- Need for alternative therapeutics

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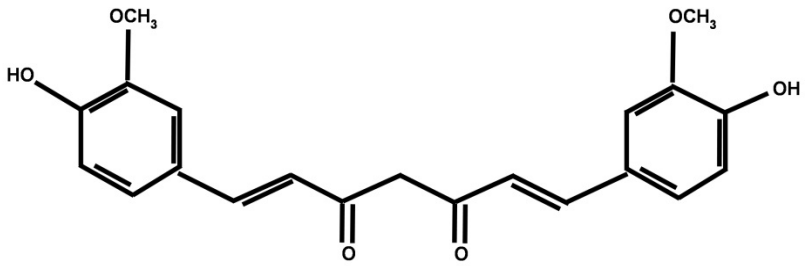
Curcumin

- *Curcuma longa*
- Potent anti-inflammatory agent
- Reduces vascular inflammation and acute injury after traumatic brain injury and subarachnoid hemorrhage
- Available through oral administration at >12g/day



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Experimental ICH Model

- Stereotaxic injection bacterial type IV collagenase into striatum

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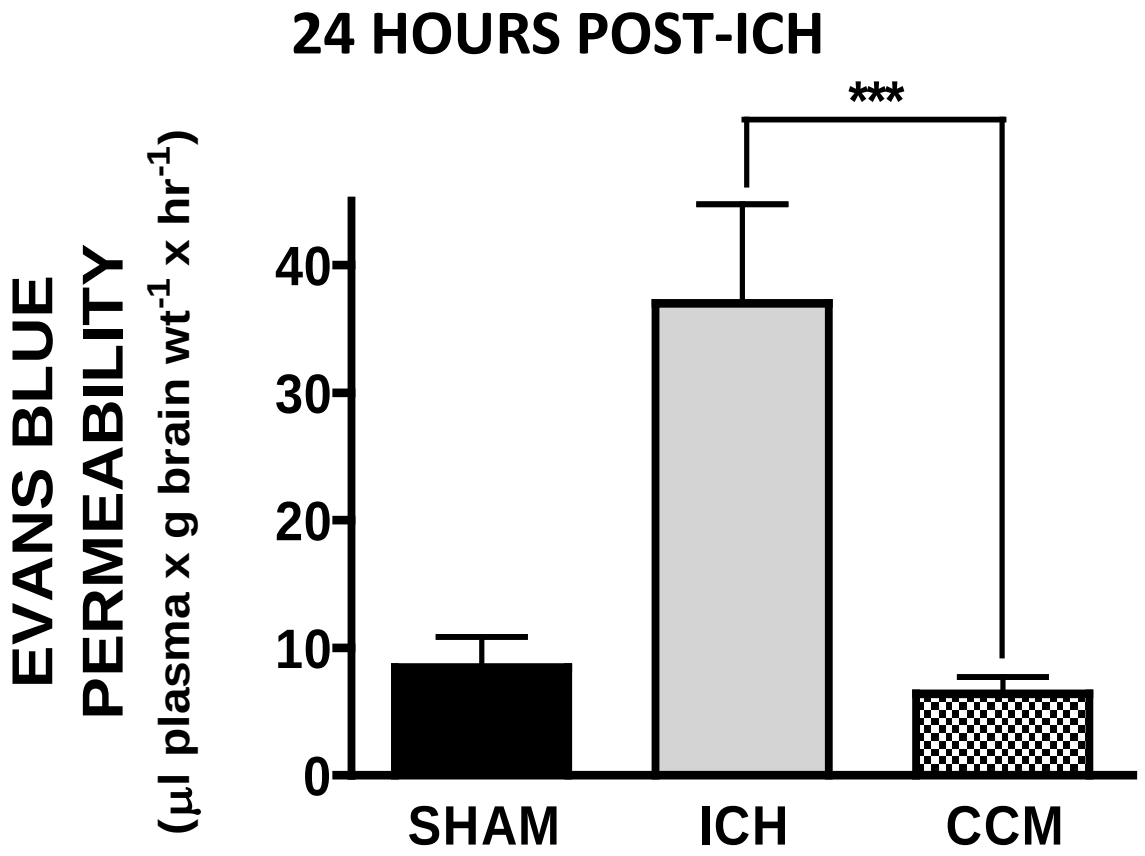
Curcumin significantly reduces BBB permeability after ICH



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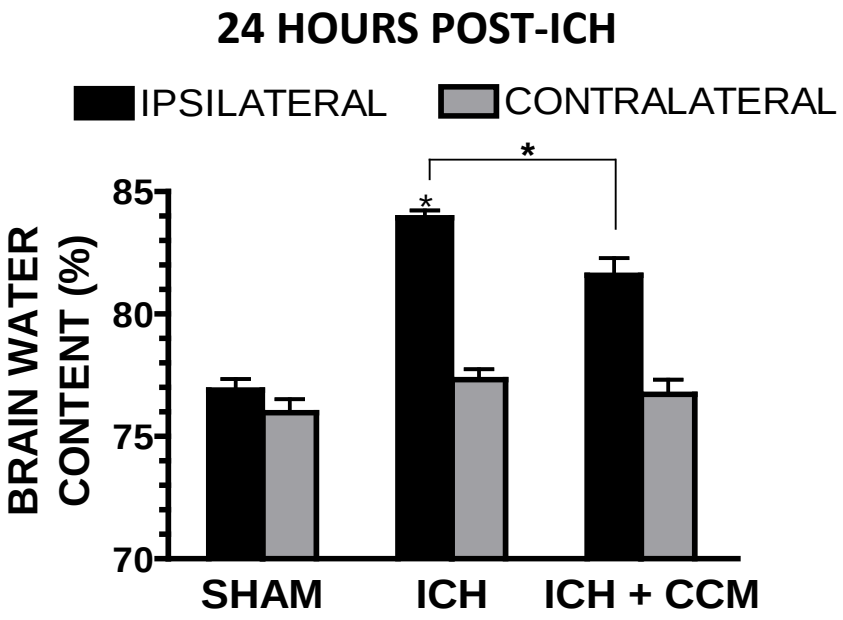
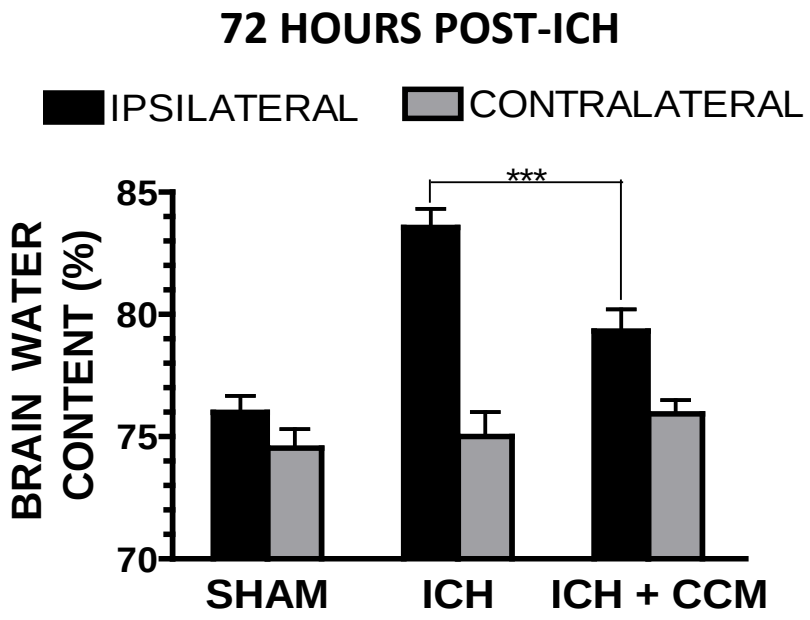
Curcumin significantly reduces cerebral edema after ICH





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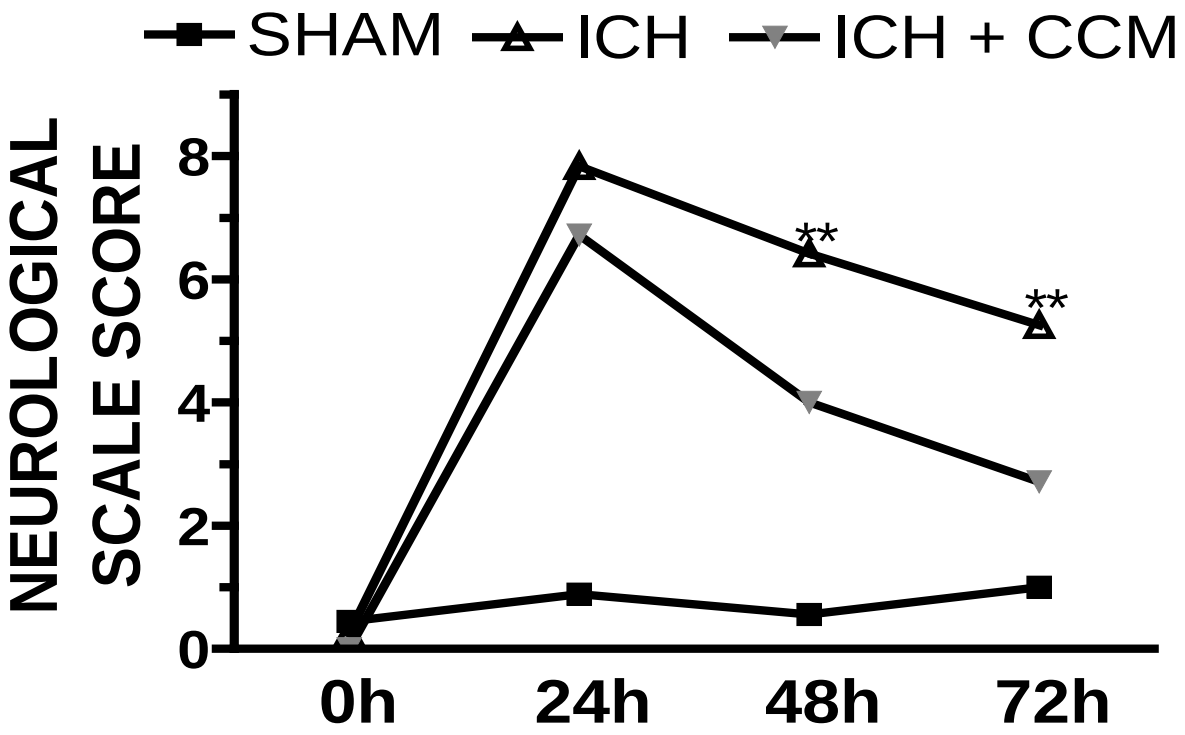
Curcumin significantly improves neurological outcomes after ICH



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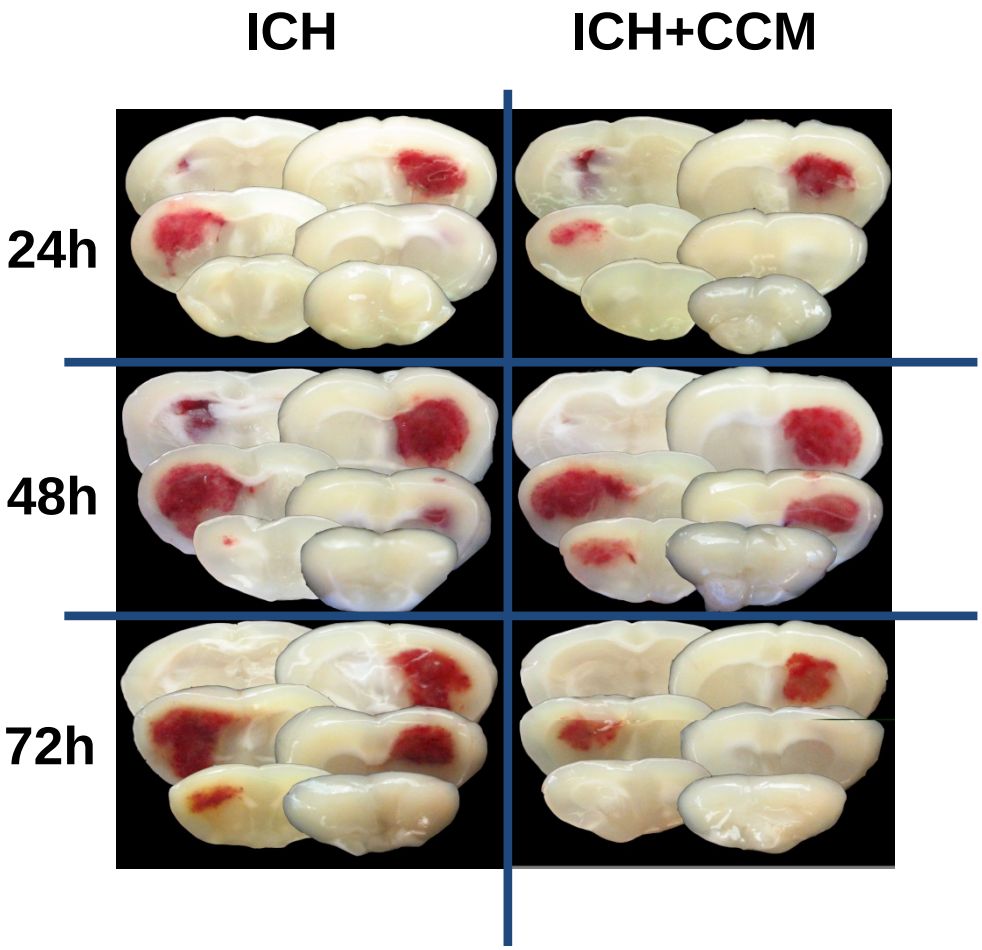
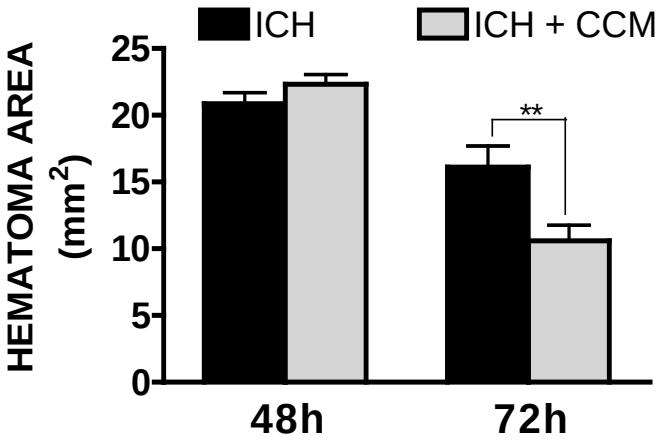
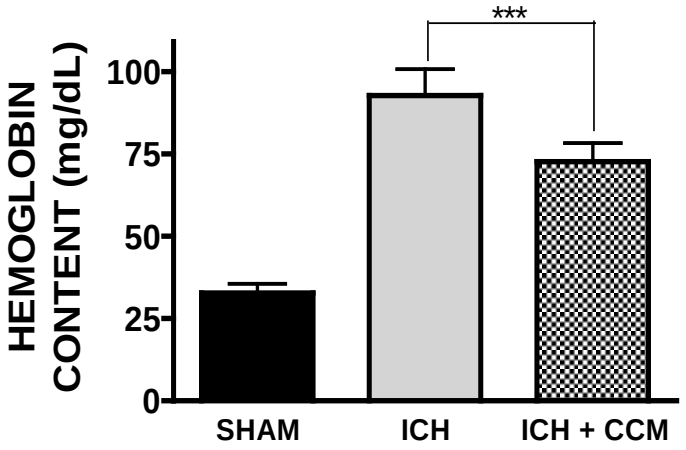
Curcumin induces hematoma resolution at 72 hours







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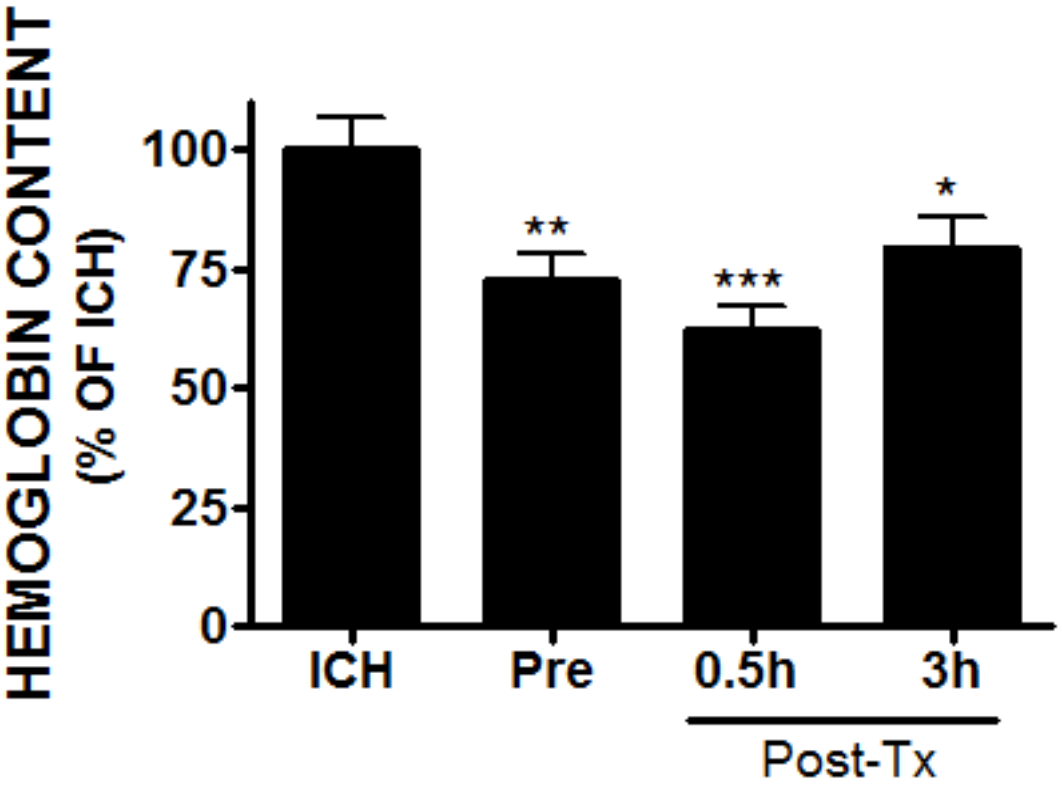
Curcumin significantly reduces hemoglobin content when administered up to 3hours post-ICH



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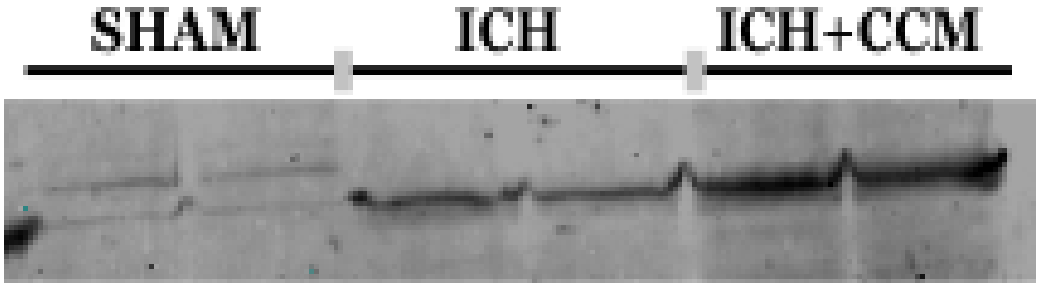
CD36

- Class B scavenger receptor
- Mediates lipid metabolism, inflammation, host defense, phagocytosis
- Promotes phagocytosis in monocyte lines
- Has been implicated in spontaneous hematoma resolution

Curcumin increases CD36 in the peri-hematoma area after ICH



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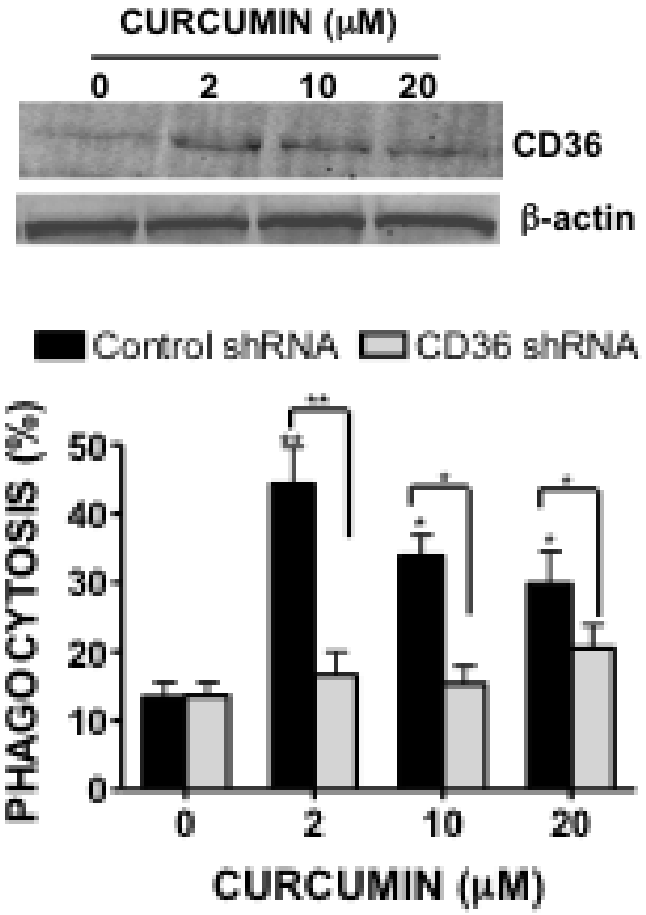
Curcumin promotes CD36 expression and phagocytosis in murine microglia



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Conclusions

- Curcumin reduces hematoma volume, secondary injury, and improves outcomes following ICH
- Curcumin increases phagocytosis via CD36 in murine microglia
- Curcumin increased expression of CD36 in peri-hematoma area after ICH
- Curcumin may provide a novel therapeutic strategy for hematoma resolution after ICH

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