A novel modification of the tetrapod scapula during development of turtles with shell closing systems

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Outline

1. Background
2. Research Objective
3. Methods and Results
4. Conclusion
5. Continued Research
The Shoulder Girdle

- The loss or reduction of bones.
- Great diversity within vertebrates.
- Turtles are the most recognizable exception.

McGonnell 2001
Turtles

- Turtles are unique that the shoulder girdle is inside shell.
- Skeletal modifications that may have accompanied shell evolution
- Shell Closing System in Box Turtles.
Research Objective

Identify the developmental process underlying the unique adaptation of the shoulder blade in Box Turtles.
MCNAIR PROGRAM

Turtle

Box Turtle

Alligator

Chicken
Evolutionary innovation
Conclusion

We provide the first description of a turtle specific developmental process required for a unique adaptation of the basic vertebrate body plan.
Continued Research

Developmental gene has been isolated.

How does switching the gene on/off affect development?
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Questions