The glass frog of the Costa Rican rainforest

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In news– In a study researchers have reported that when a glass frog falls asleep, almost all of its red blood cells retreat into its liver.

About the glass frog & See through frog-

- **Native to forests of Central and South America, glass frogs in the family Centrolenidae get their name from their translucent skin and muscles** that blend them seamlessly into their jungle environment.
- Flip the amphibians over, where the effect is most impressive, and you'll see their hearts, livers, and squiggly coils of intestines—no dissection needed.
- Apart from a **lime green smear across its back, its skin, muscle and other tissues are see-through**.
- Then there are its tiny organs, which seem to float within this clear flesh, like a pale fruit cocktail in the weirdest Jell-O salad ever to grace a tree branch.
- **As handy as translucence might be for evading predators,** it is rare in animals that live on land.
- Their bodies are full of substances that light can't penetrate, many of them essential for life.
- Glass frogs seem to have evolved see-through versions of some of these anatomical features, but they also have some tricks to hide lingering colors when they are at their most vulnerable.

Key findings-

- The researchers reported that when a glass frog falls asleep, almost all of its red blood cells retreat into its liver.
- **They hide in the organ and allow the frog to achieve near invisibility while it rests**. In addition to

revealing another remarkable adaptation in nature, the discovery could lead to **clues for how to prevent deadly blood clots.**

- **Like people, glass frogs rely on hemoglobin, a colored protein in red blood cells that delivers oxygen around the body.**
- The authors of the new paper had been spending a lot of time observing the frogs when they realized that sometimes, that red color seemed to disappear.
- **To solve the mystery of the disappearing blood cells**, the researchers and their colleagues wanted to take images of the frogs under anesthesia – when the blood cells were clearly visible circulating through their bodies – and asleep, when the cells were nowhere to be seen.
- To do that, they needed to find a way to peer inside the frog's organs, which have a mirror-like exterior that helps the frog blend in.
- They suspected that the blood would retreat to various organs when not in circulation.
- The researchers wound up relying not on light but on sound to show them what was inside.
- They provoked the molecules within the sacs to release ultrasonic waves, which could be used to identify the contents.
- As soon as they compared the images of sleeping and anesthetized frogs, one big difference jumped out.
- They have found that all the signal was coming from the liver. About 89% of the frogs' red blood cells had packed themselves into that organ.
- What was stranger, and what the researchers still don't understand, was how the frogs could cram all these cells together without dying from blood clots.
- **In most vertebrates, when blood cells bump into each other, it leads to coagulation.**
- **The resulting clot can make a scab to seal a wound** – or, if the clot is in a blood vessel, it can plug up the

circulatory system and kill the creature.

- **Glass frogs,** the new research suggests, can control when their blood clots. **If they are wounded, they will form a scab in the usual way**. But **when they are asleep, with red blood cells packed like sardines in the liver, no clot forms.**
- **The finding implies that glass frogs could have something to teach us about how to prevent clot formation in our own bodies.**
- If future research can illuminate what keeps the frogs safe, it could lead to treatments to reduce deaths from clots in humans.
- More immediately, the researchers said, the results raised other questions. If 89% of the cells that carry oxygen are holed up in the liver while the frog sleeps, how is it breathing?
- They wonder whether the frogs can shift their metabolisms to a mode that requires barely any oxygen, perhaps akin to what other frogs do when they hibernate for the winter.