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Título	Variations in tetrodotoxin levels in populations of <i>Taricha granulosa</i> are expressed in the morphology of their cutaneous glands
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Resumo	<p>Tetrodotoxin (TTX), one of the most toxic substances in nature, is present in bacteria, invertebrates, fishes, and amphibians. Marine organisms seem to bioaccumulate TTX from their food or acquire it from symbiotic bacteria, but its origin in amphibians is unclear. <i>Taricha granulosa</i> can exhibit high TTX levels, presumably concentrated in skin poison glands, acting as an agent of selection upon predatory garter snakes (<i>Thamnophis</i>). This co-evolutionary arms race induces variation in <i>T. granulosa</i> TTX levels, from very high to undetectable. Using morphology and biochemistry, we investigated differences in toxin localization and quality between two populations at the extremes of toxicity. TTX concentration within poison glands is related to the volume of a single cell type in which TTX occurs exclusively in distinctive secretory granules, suggesting a relationship between granule structure and chemical composition. TTX was detected in mucous glands in both populations, contradicting the general understanding that these glands do not secrete defensive chemicals and expanding currently held interpretations of amphibian skin gland functionality. Skin secretions of the two populations differed in low-mass molecules and proteins. Our results demonstrate that interpopulation variation in TTX levels is related to poison gland morphology.</p>
Fomento	