Esculentin

Also called: Esculentin-1; Esculentin-2; Esc(1-21); Esculentins; Esculentin-2CHa

What it is

Esculentins are a family of cationic, amphipathic, alpha-helical antimicrobial peptides from the skin of water/edible frogs (Pelophylax), first described by Simmaco et al. (1994). Esculentin-1 (~46 amino acids) is among the longest, most potent frog AMPs and esculentin-2 (~37) is shorter; both carry a C-terminal disulfide 'Rana box'. They disrupt microbial membranes broadly (notably Gram-negative bacteria), and members and engineered fragments (Esc(1-21), esculentin-2CHa) show wound-healing and metabolic activity (PMIDs 42725961, 36385013). They are research antimicrobial peptides, not approved medicines, and have never been given to people as a treatment.

Approval status

Research Chemical. Not drugs: Drugs@FDA and the openFDA label endpoint hold no record, and FDA GSRS and ChEMBL hold no approved-drug record for esculentin peptides (searched November 7, 2026). They are frog-skin antimicrobial peptides studied as antibacterial, antibiotic-potentiating, wound-healing and metabolic leads and as engineering scaffolds; there is no therapeutic development to market and no registered interventional trial of giving an esculentin to people.

Dosing, as printed in the page's Recommended Dosing box

No established human dose

Esculentins are frog-skin research peptides; none has been given to people as a treatment. The work is in bacteria, cultured cells and animals, often with engineered fragments or constructs, at experimental amounts that do not carry over to people.

Educational information, not medical advice. None is a recommendation for you. An unapproved compound has no established safe or effective human dose, and products sold for "research use only" are not made or tested for people. Talk to a doctor before acting on anything on this site, including before you start, stop or change any medicine or dose.

Key human evidence

No human study is carded on the page; its 6 study cards are reviews, animal or cell work. The first 2:

• **Esc(1-21) peptides restore an antibiotic against resistant Klebsiella** (In Vitro, 2026). The esculentin-1a fragment Esc(1-21) and D-amino-acid analogs permeabilised the outer membrane of carbapenemase-producing (KPC) Klebsiella pneumoniae and potentiated the cephalosporin ceftazidime, with the combination killing bacteria better than either agent alone — supporting esculentin-derived peptides as adjuvants that restore beta-lactam activity against multidrug-resistant Gram-negatives (an in-vitro mechanism study). **PMID 42725961**

• **Esculentin-1a derivatives promote human dermal fibroblast wound healing** (In Vitro, 2026). Esc(1-21) and its derivatives increased the migration of human primary dermal fibroblasts and closed a model wound by activating MAPK/ERK signalling (via EGFR for two of the peptides) and up-regulating early wound-healing genes such as collagen I and III, without changing cell proliferation — evidence for a tissue-regenerative role beyond antimicrobial activity (an in-vitro study). **PMID 42004462**

Interactions

A PubMed search for interaction studies of this compound with any drug (November 7, 2026, 5 records) found none in people. That is not evidence that it is safe to combine with anything.

Side effects and cautions

Reported side effects	Contraindications and cautions
• No human adverse-event data exist: no published study has administered an esculentin to people • As membrane-active peptides, hemolysis and cytotoxicity to host cells are the central safety concern; the short Esc(1-21) fragment and engineered constructs are chosen partly to lower toxicity (PMIDs 42725961, 38925336) — a design issue, not human data • Engineered esculentin-2CHa constructs are studied for metabolic disease in animals (PMID 40125429); their safety in people is unknown • Material sold online as an 'esculentin' is an unregulated research chemical of unverified content	• Not medicines: no FDA application or label, and no approval anywhere • No human dosing, interaction, pregnancy or long-term safety data exist for administered esculentins • They are frog-skin research antimicrobial peptides, not treatments • Their membrane-active nature (hemolysis/cytotoxicity) warrants caution about effects on host cells in any use

Five questions to ask

1. Esculentin is listed here as "Research Chemical". What does the evidence on this sheet mean for someone in my situation, and is there an approved treatment I should consider instead?
2. Here are the medicines and supplements I take. Do any of them interact with Esculentin? This sheet records none published, which does not mean none exist.
3. Which side effects should make me stop and call you, for example no human adverse-event data exist: no published study has administered an esculentin to people?
4. Do any of the cautions on this sheet apply to me, such as: Not medicines: no FDA application or label, and no approval anywhere?
5. What should we check before I start and while I am on it (blood tests, blood pressure, weight), and how often?

Grey Peptides is a vendor-neutral encyclopedia: it sells nothing and names no seller. This sheet is educational, not medical advice, and is not a prescription.