HKb20

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HKb20 is a genetically engineered human embryonic kidney (HEK293-derived) cell line that has been stably transfected to express the Bombyx mori cadherin-like protein BtR175b, a known receptor for Bacillus thuringiensis Cry1A toxins. The cell line was generated through stable integration of BtR175b cDNA into HEK293 cells, followed by antibiotic selection, resulting in a clone (HKb20) that expresses the receptor on the plasma membrane. Biochemical analysis demonstrates that the expressed BtR175b protein appears as an approximately 200 kDa membrane-associated protein and retains functional binding capacity for Cry1Aa toxin, confirming proper folding and receptor activity in a mammalian cellular context.
HKb20 cells exhibit acquired susceptibility to Cry1A toxins, particularly Cry1Aa, which is not observed in untransfected HEK293 cells. Exposure to activated Cry1Aa induces dose- and time-dependent cytotoxic effects, including reduced cell viability, release of lactate dehydrogenase (LDH), and characteristic morphological changes such as cell swelling and detachment. As shown in the data on pages 3–5, Cry1Aa treatment leads to measurable cytotoxicity within one hour, with membrane damage reflected by increased LDH release and visible morphological alterations under microscopy. The specificity of this response is receptor-mediated, as HKb20 cells display higher sensitivity to Cry1Aa compared to Cry1Ab and Cry1Ac, consistent with the binding affinity profile of BtR175b.
HKb20 serves as a valuable in vitro model for studying Cry toxin–receptor interactions and mechanisms of toxin-induced cytotoxicity in a controlled mammalian system. Unlike insect-derived models, this system isolates the contribution of a single defined receptor, enabling precise evaluation of toxin specificity, receptor function, and structure–activity relationships. Consequently, HKb20 cells are particularly useful for high-throughput screening and functional characterization of Cry protein variants, as well as for investigating mechanisms underlying toxin resistance and receptor-mediated membrane disruption.

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GMO-S1: This HEK-derived Hkb20 line contains a construct encoding Bombyx mori BtR175b introduced via adenovirus-5-based delivery. This classification applies only within Germany and may differ elsewhere.

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HKb20 (Cytion catalog number 305613)

NCBI □□ □□□□	9606
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EMEM (MEM Eagle), w: 2 mM L-Glutamine, w: 2.2 g/L NaHCO3, w: EBSS (Cytion article number 820100a)

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Supplement the medium with 10% FBS, 1% NEAA, 800 µg/ml G418

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Confirm that the vial remains deeply frozen upon delivery, as cells are shipped on dry ice to maintain optimal temperatures during transit.
Upon receipt, either store the cryovial immediately at temperatures below -150°C to ensure the preservation of cellular integrity, or proceed to step 3 if immediate culturing is required.
For immediate culturing, swiftly thaw the vial by immersing it in a 37°C water bath with clean water and an antimicrobial agent, agitating gently for 40-60 seconds until a small ice clump remains.
Perform all subsequent steps under sterile conditions in a flow hood, disinfecting the cryovial with 70% ethanol before opening.
Carefully open the disinfected vial and transfer the cell suspension into a 15 ml centrifuge tube containing 8 ml of room-temperature culture medium, mixing gently.
Centrifuge the mixture at 200 x g for 5 minutes, carefully discard the supernatant containing freezing medium.
Follow the procedure described under Post-Thaw Recovery

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For long-term preservation, place vials in vapor-phase liquid nitrogen at about −150 to −196 °C. Storage at −80 °C is acceptable only as a short interim step before transfer to liquid nitrogen.

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Cryopreserved cell lines are shipped on dry ice in validated, insulated packaging with sufficient refrigerant to maintain approximately −78 °C throughout transit. On receipt, inspect the container immediately and transfer vials without delay to appropriate storage.

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When planning to store a cryovial in liquid nitrogen for future thawing, it is mandatory to adhere to stringent safety measures. Appropriate protective gloves and clothing are essential, and the use of a face mask or safety goggles is required during the transfer of frozen samples to or from the liquid nitrogen tank. This is to mitigate the risk of injury from potential cryovial explosions upon removal, which can result in the projection of sharp fragments.

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At Cytion, we stand behind the quality and viability of our products.
We guarantee that our cells will be viable at the start of culture for
60 days after shipment from our facilities.
We assure that all materials conform to the specifications described in the
Certificate of Analysis and/or Product Sheet.
For full details, please refer to our
Warranty Statement.

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