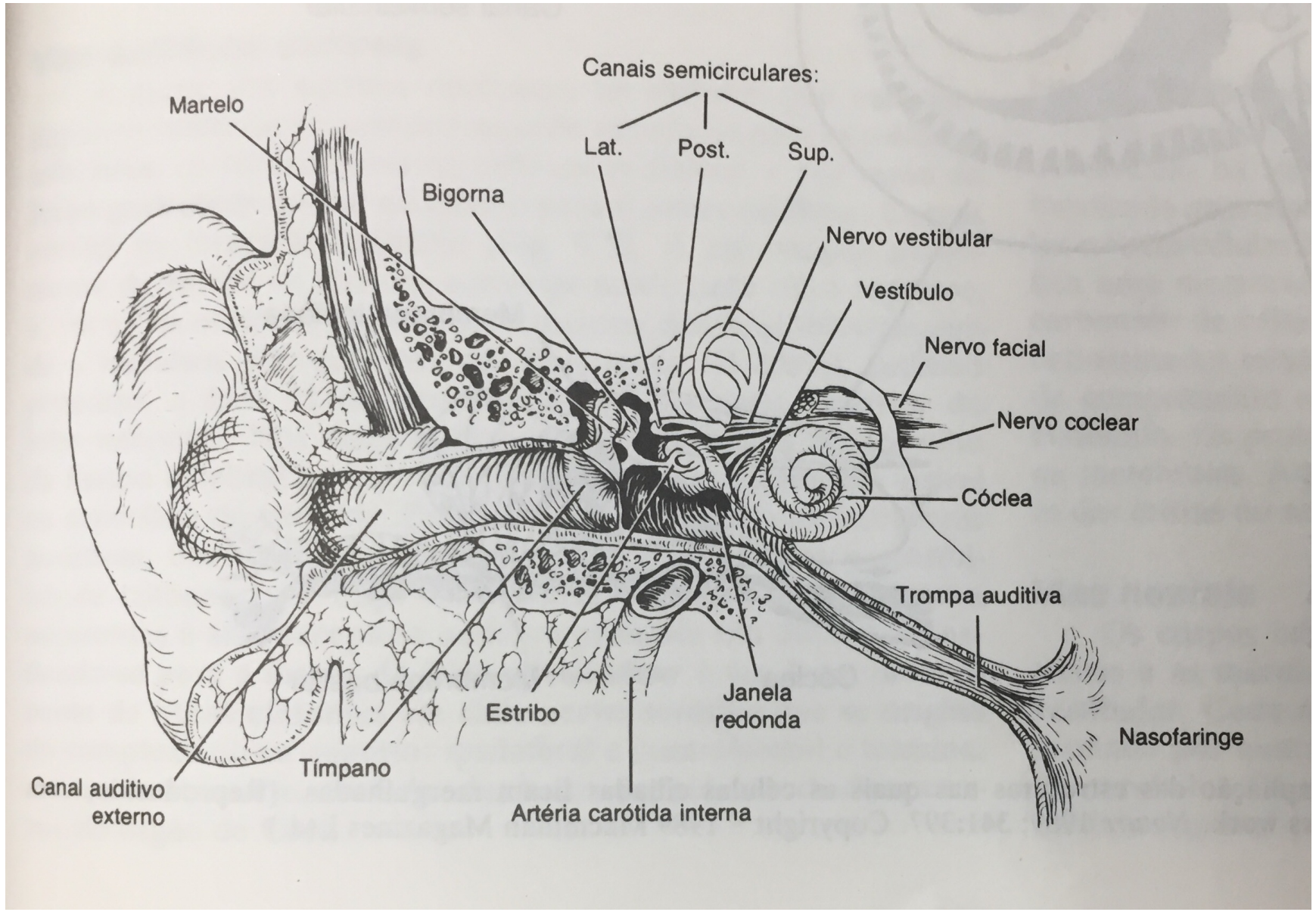
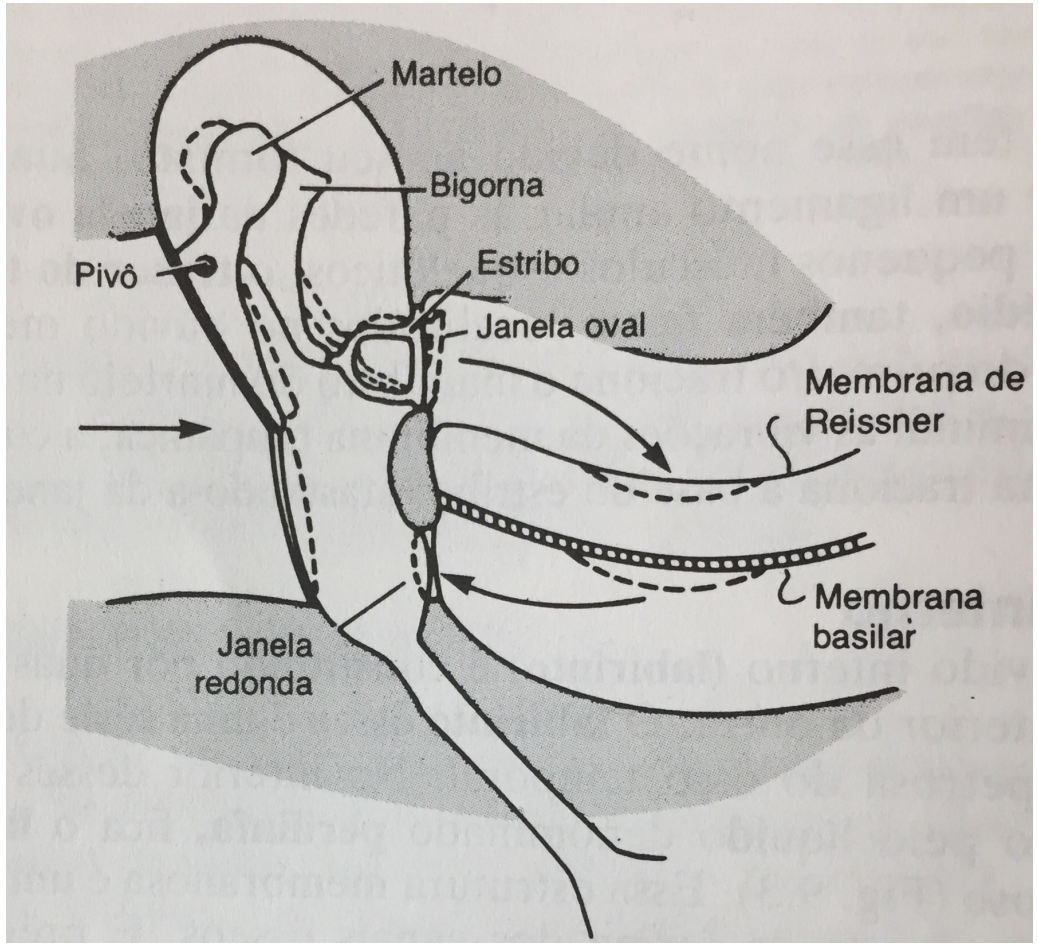
# Sistema auditivo do corpo humano

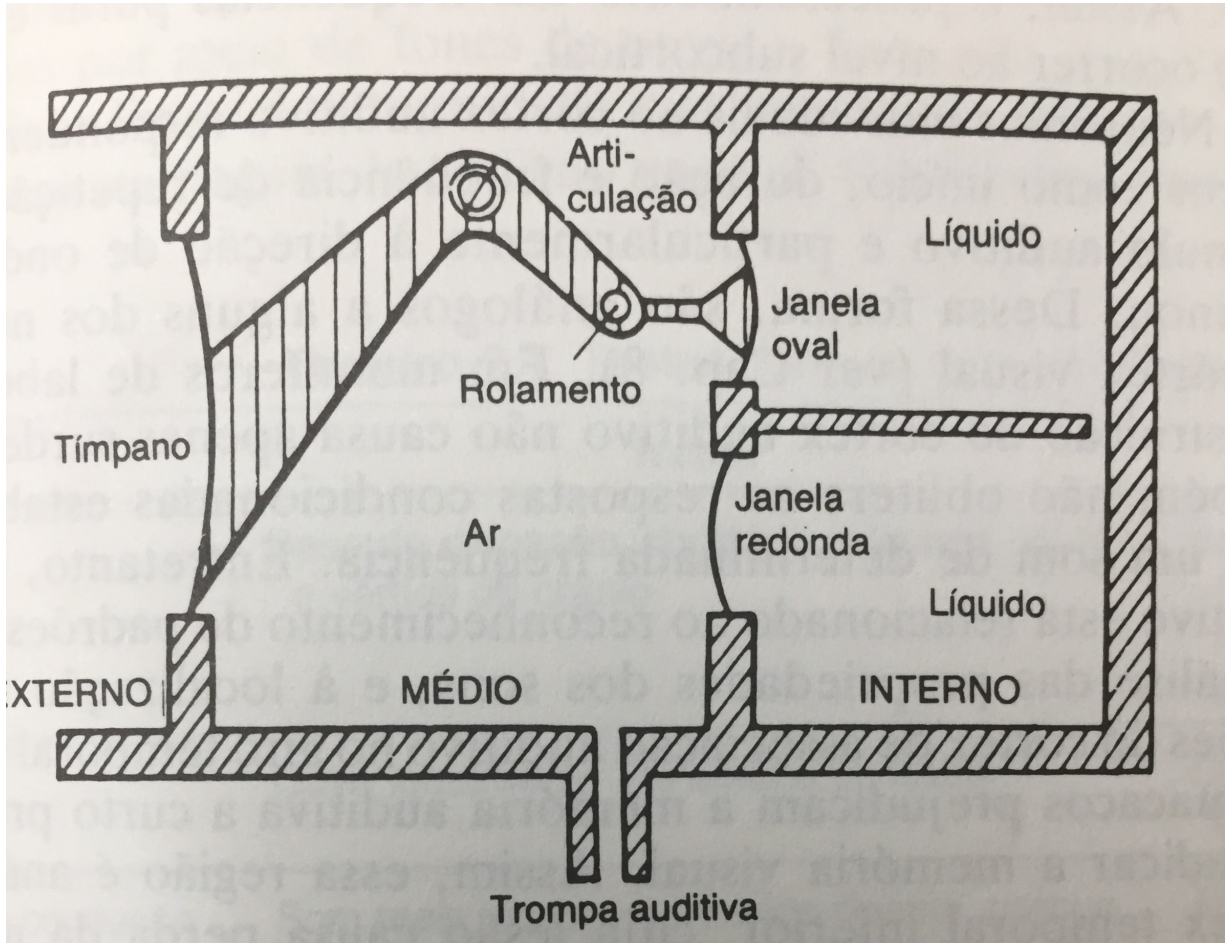
# Sensibilidade do ouvido humano para diferentes frequências


http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html




W. F. Ganong Fisiologia Médica.

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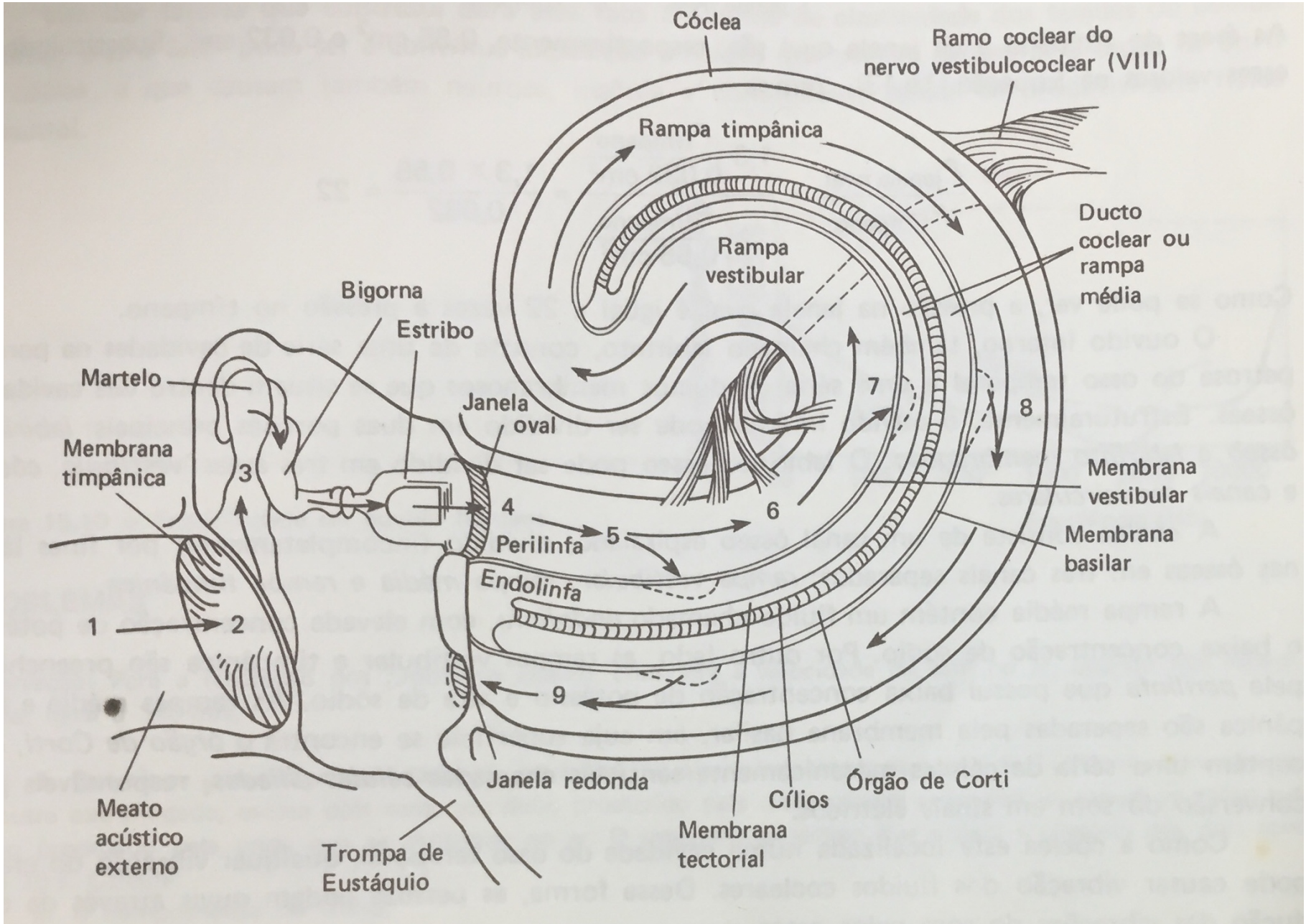


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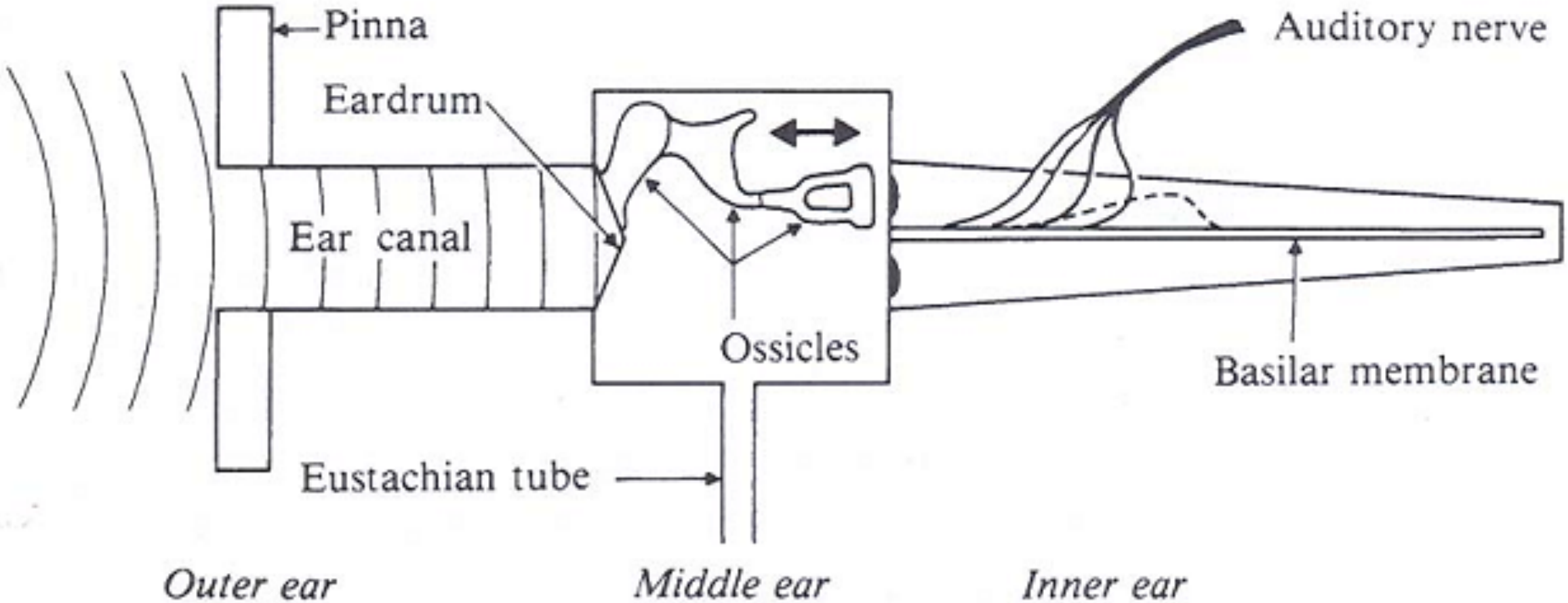
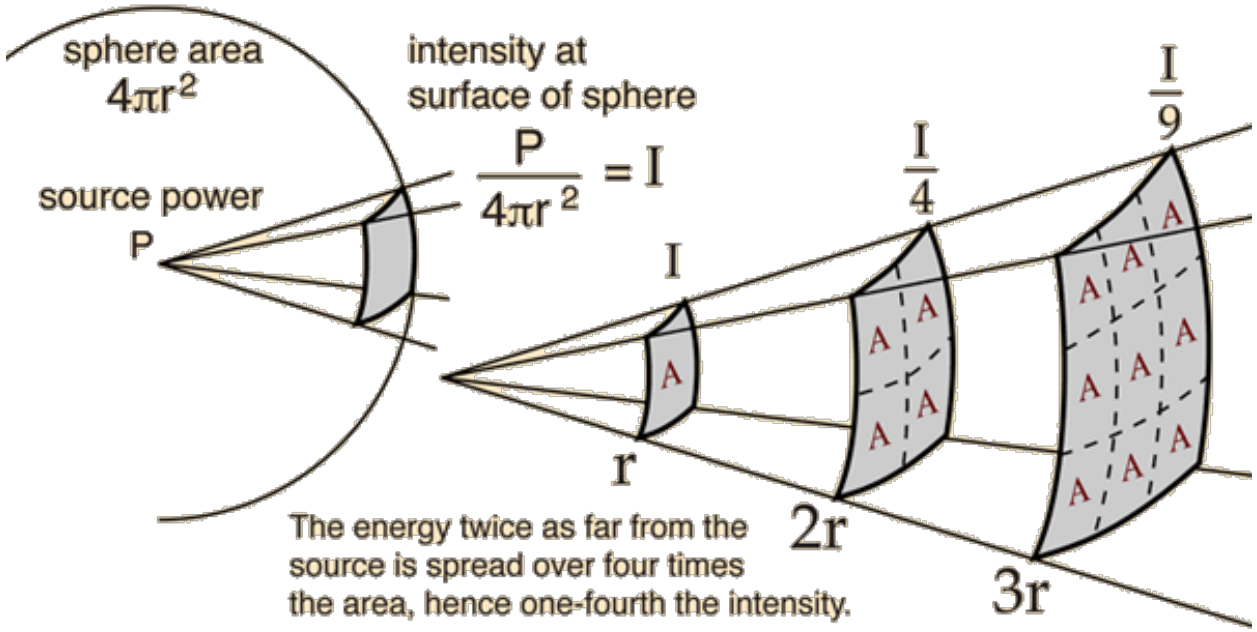
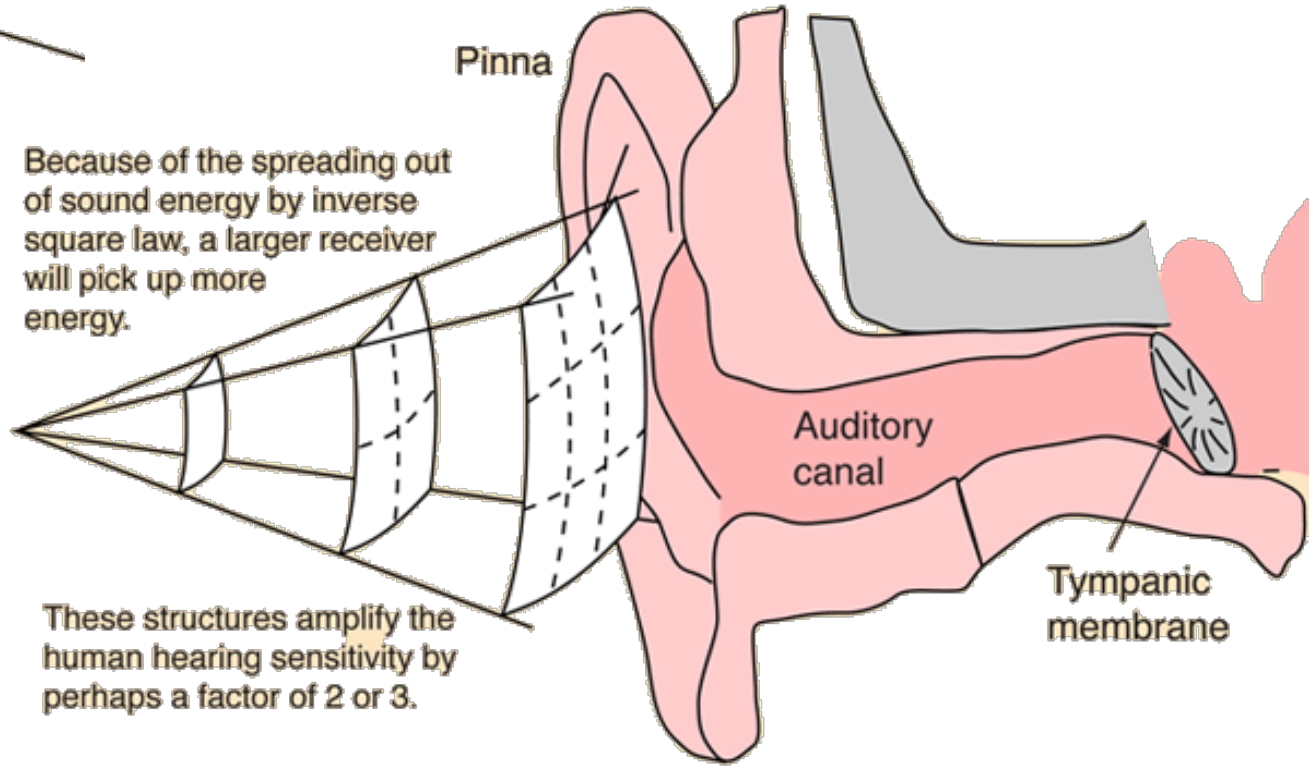
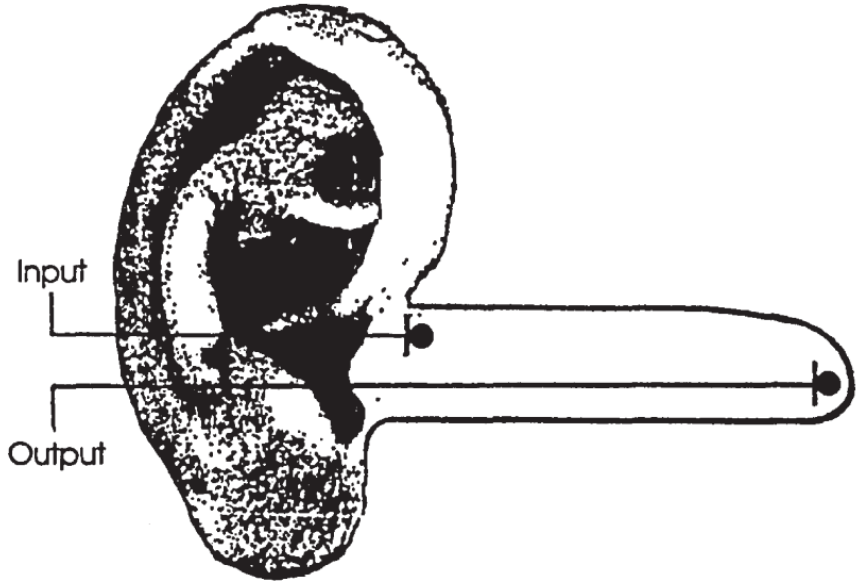

Pinna
Eardrum
Ear canal
Ossicles
Eustachian tube
Auditory nerve
Basilar membrane
Outer ear
Middle ear
Inner ear

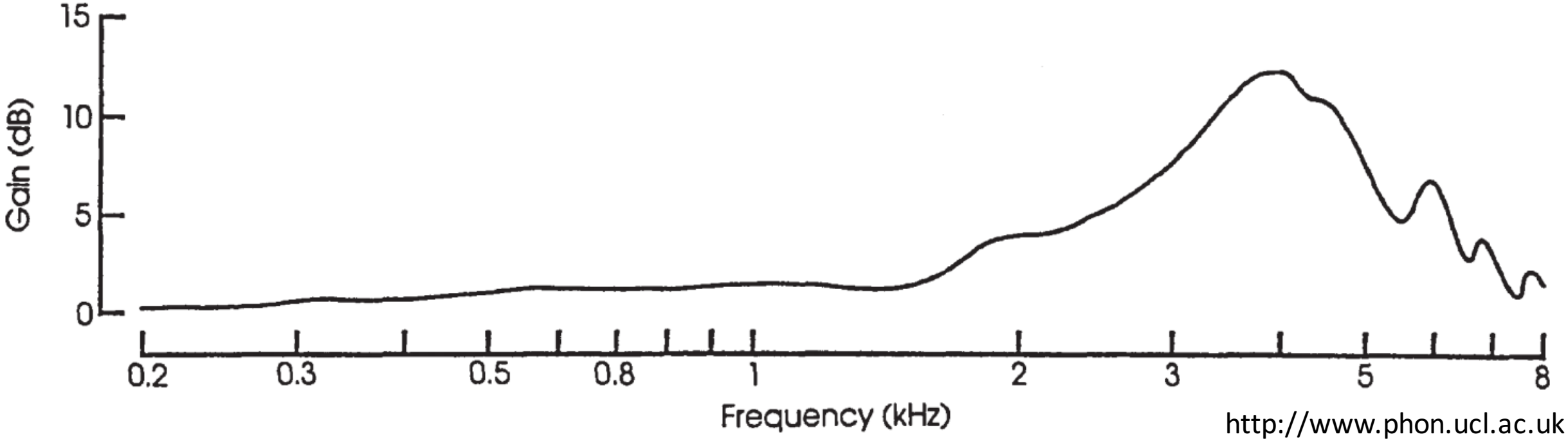
## Dependência com a distância da fonte



**Ressonância do canal auditivo**
**Comprimento do canal = 2.3cm**
**Velocidade do som = 340m/s**

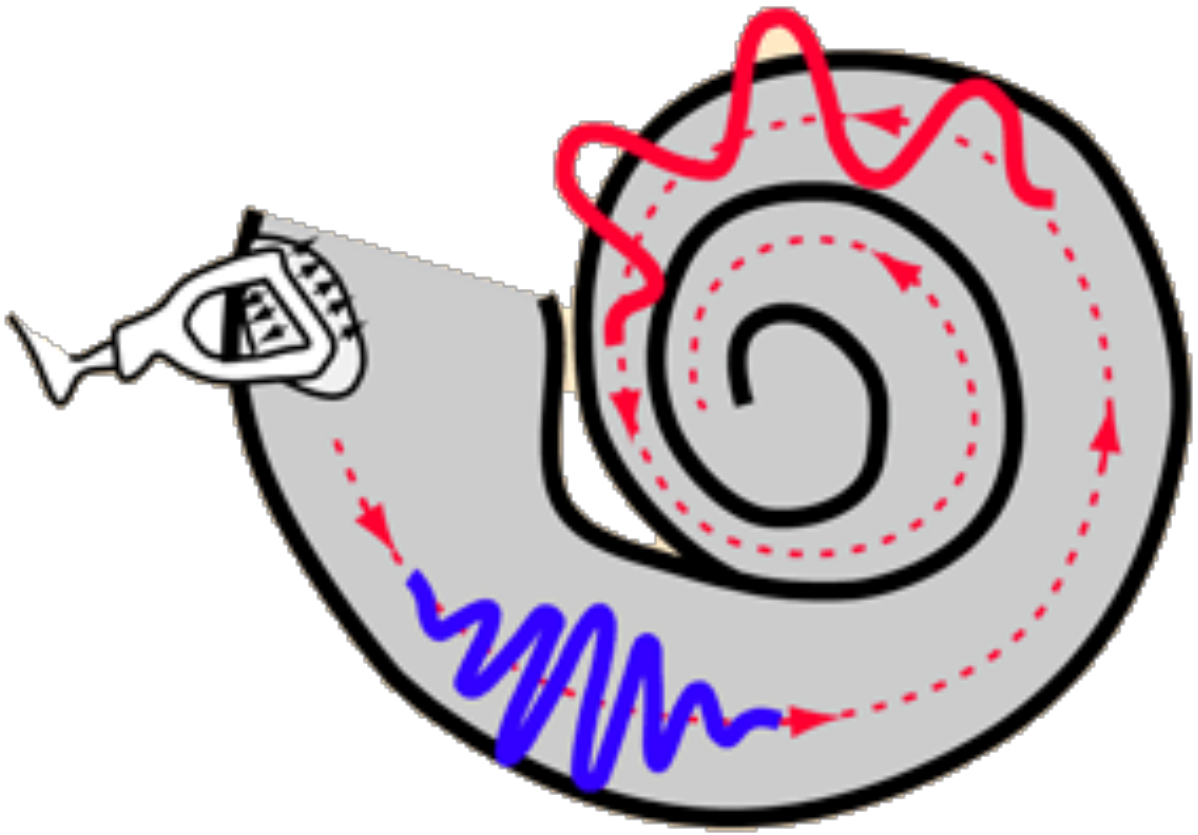


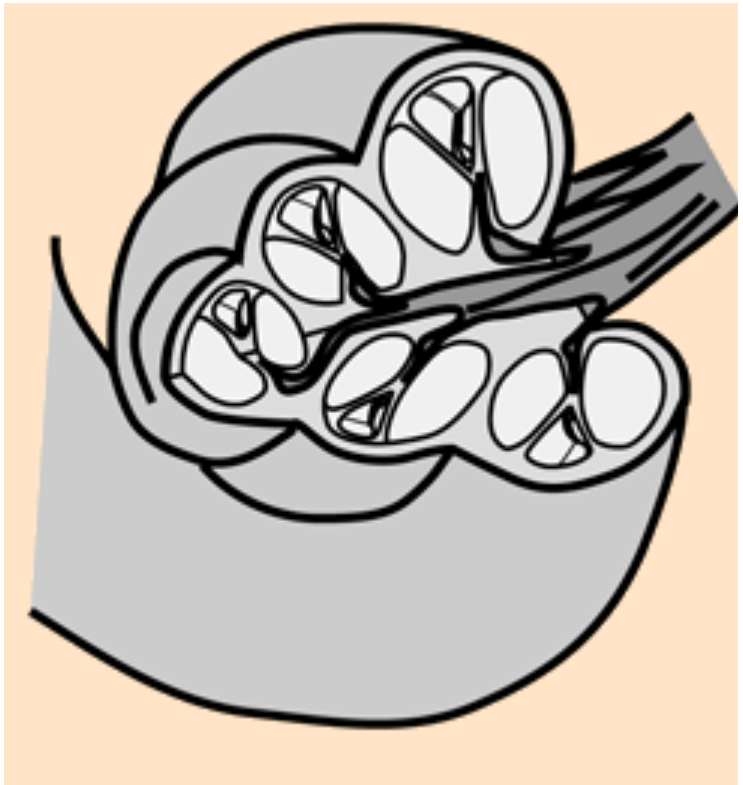



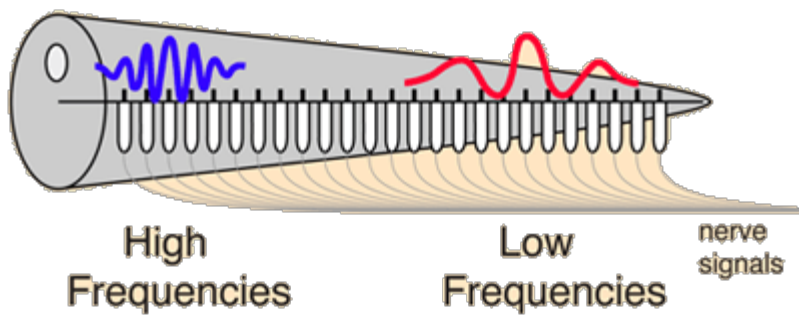

http://www.phon.ucl.ac.uk

**Como identificar a altura do som, i. e., a frequência.**

| | |
|---|---|
| Cochlea: | $2\frac{3}{4}$ turns,<br>about 3.2 cm length.<br>Resolves about 1500 separate pitches<br>with 16,000-20,000 hair cells. |





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**Há um mecanismo que permite o ouvido detectar a frequência de um som usando apenas poucas células, da ordem de 12 células**

| | |
|---|---|
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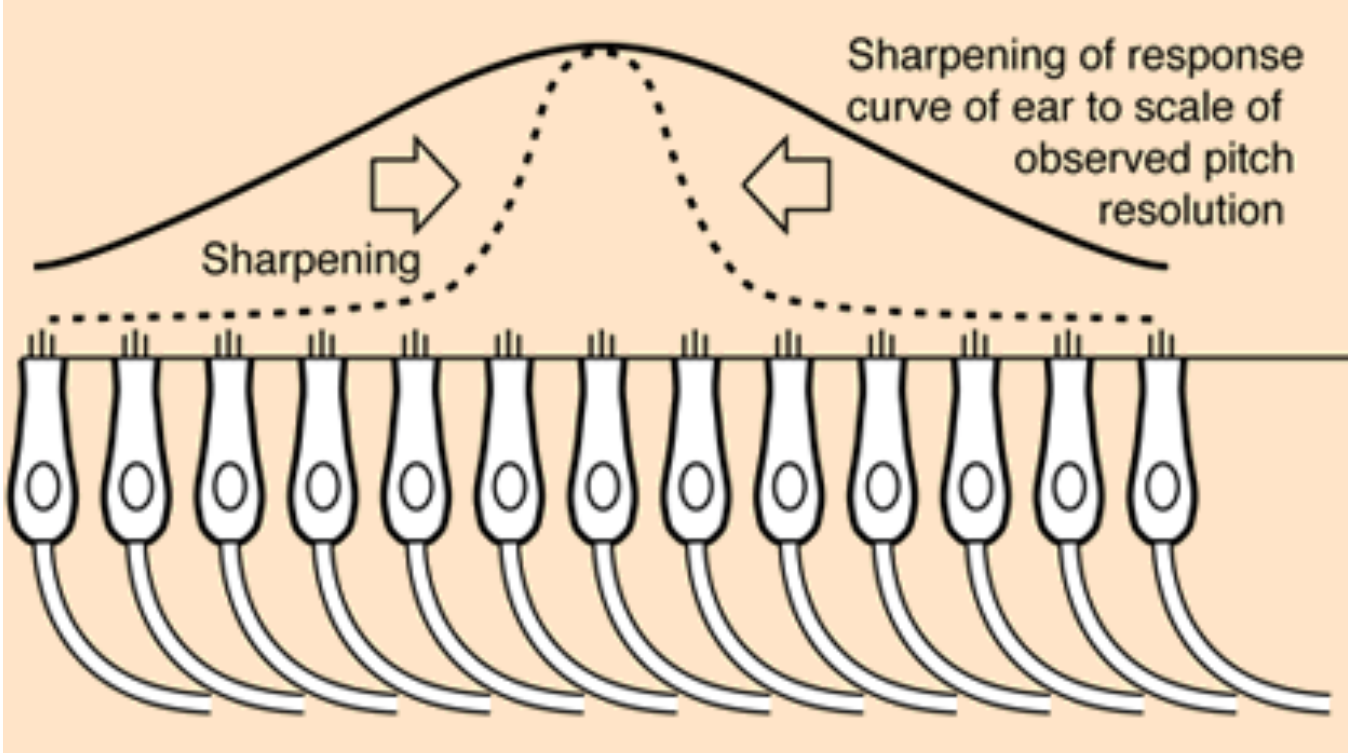


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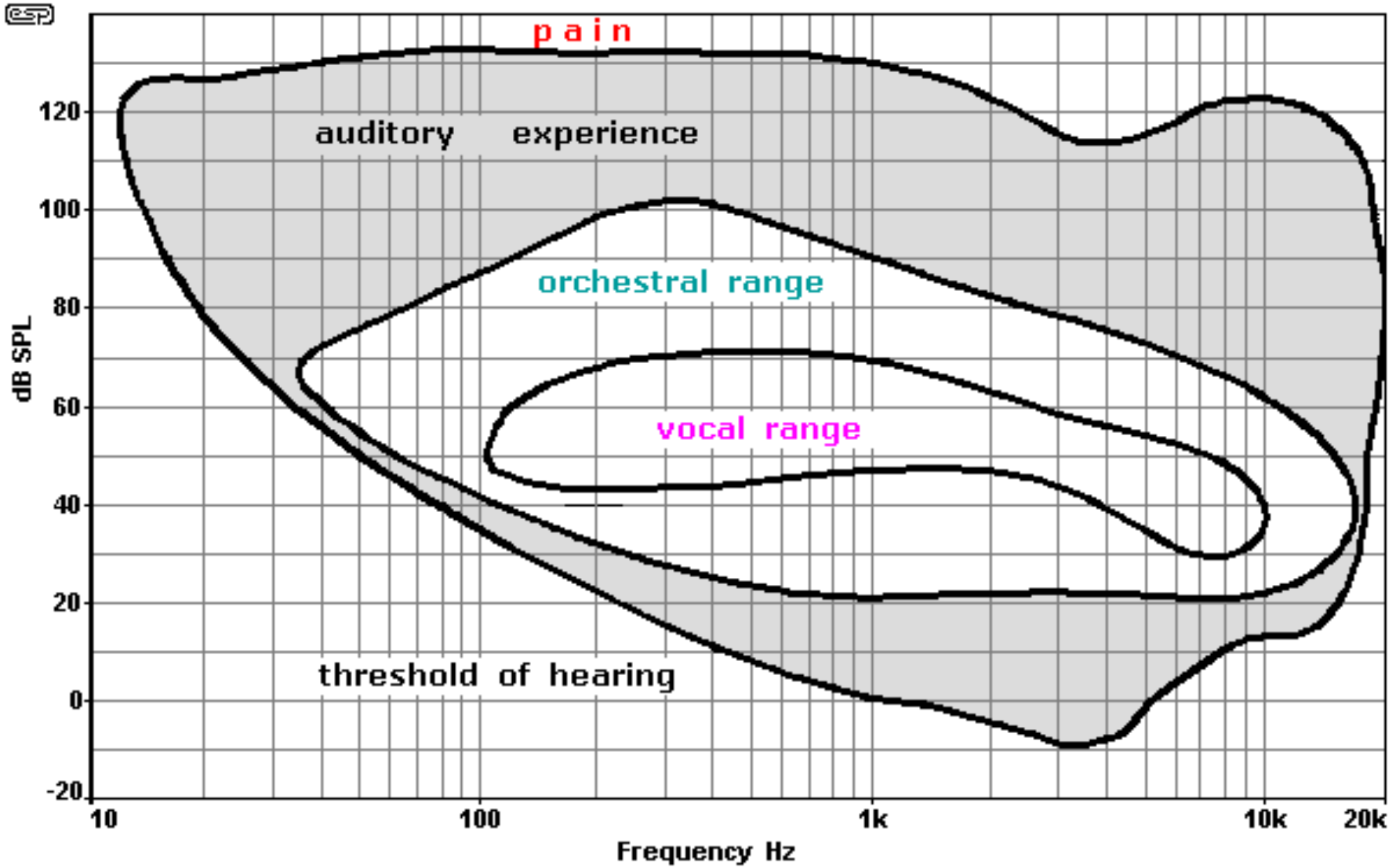
## Conceitos físicos sobre a fala




Frequência fundamental:
Homens 106 Hz, com range entre 77 Hz e 482 Hz.
Mulheres, 193 Hz, com range entre 137 Hz to 634 Hz.

Stemple, J. C., Glaze, L. E., Gerdeman-Klaben, B., Clinical Voice Pathology, Theory and Management, 3rd Ed., Canada: Singular Publishing Group (2000).