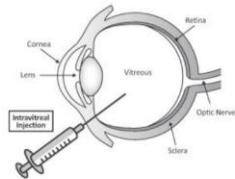


The use of targeted/biological therapy in ophthalmology

- used primarily substances with **antiangiogenic activity** (ie. block of neovascularization)
- most importance for the process of angiogenesis , VEGF = **vascular endothelial growth factor**
 - important physiological functions
 - located on the lining of blood and lymph vessels in the body
 - regulates the proliferation and vascular permeability
 - several types (A - E)
- **drugs used**
 - monoclonal antibodies (**bevacizumab, ranibizumab**)
 - small drugs (**pegaptanib, vertepofin**)
 - **afibercept**= fusion protein

The use of targeted/biological therapy in ophthalmology

- intravitreal administration
- therapy usually takes a year or more
- **advantages:** fewer adverse systemic effects of drugs
- **cons:** clogging, intraocular infection , atrophy of the retinal pigment sheet , haemophthalmus..



The use of targeted/biological therapy in ophthalmology



- **Bevacizumab** - was developed for the treatment of colorectal cancer, indication AMD is used off-label
 MA : monoclonal antibody against VEGF (binds VEGF1 and VEGF2 , blocks the interaction of DP.)
 AE: acceleration of hypertension, proteinuria, thromboembolic events, poor wound healing...
- **ranibizumab**
 - Indications : AMD , CNV (chorioidal neovascularization)
 - MA : fragment of a monoclonal antibody against VEGF - A
 - short plasma half-life
 - Administration 1x per month until the patient's visual acuity is stable (three consecutive monthly assessments)

The use of targeted/biological therapy in ophthalmology

- **pegaptanib** - synthetic oligonucleotide
- inactivation of the extracellular vascular endothelial growth factor (VEGF165), specific binding
- VEGF165 is responsible for angiogenesis, increased vascular permeability and other inflammatory changes that play a role in the wet form of AMD
- I: therapy of the wet form of AMD
- CI: eye infection, allergy
- intravitreal drug administration: 0,3 mg pegaptanib (i.e. 90 microliters) (9x per year)
- aseptic conditions, with a local anaesthetic and an ATB

The use of targeted/biological therapy in ophthalmology

- **verteporfin** - synthetic benzoporphyrin derivative
- photosensitizer for photodynamic therapy to eliminate abnormal blood vessels in the eye (blockage and local damage to the endothelium)
- accumulation in the abnormal blood vessels
- production of highly reactive oxygen radicals when stimulated by nonthermal red light (wavelength of 689nm) in the presence of oxygen
- I: therapy of the wet form of macular degeneration (AMD)
 - also for the therapy of secondary subfoveal chorioidal neovascularisation in pathologic myopia

The use of targeted/biological therapy in ophthalmology

- **aflibercept** - recombinant fusion protein composed of the extracellular domen of the human (vascular endothelial growth factor) VEGF receptor 1+ 2 fused with the Fc fragment of the human Ig G1
- as a false soluble "decoy" receptor it binds to the VEGF-A and PlGF (placental growth factor) with high affinity, thus it blocks the angiogenic effect of the VEGF
- I: intravitreal administration in the wet form of AMD in adults
 - also for the therapy of diabetic macular edema (DME)
 - vision impairment caused by the chorioidal neovascularisation in pathologic myopia
 - vision impairment caused by the macular edema after retinal vein occlusion
- CI: allergy, eye infections
