GERMAN CANCER RESEARCH CENTER IN THE HELMHOLTZ ASSOCIATION

Research for a Life without Cancer

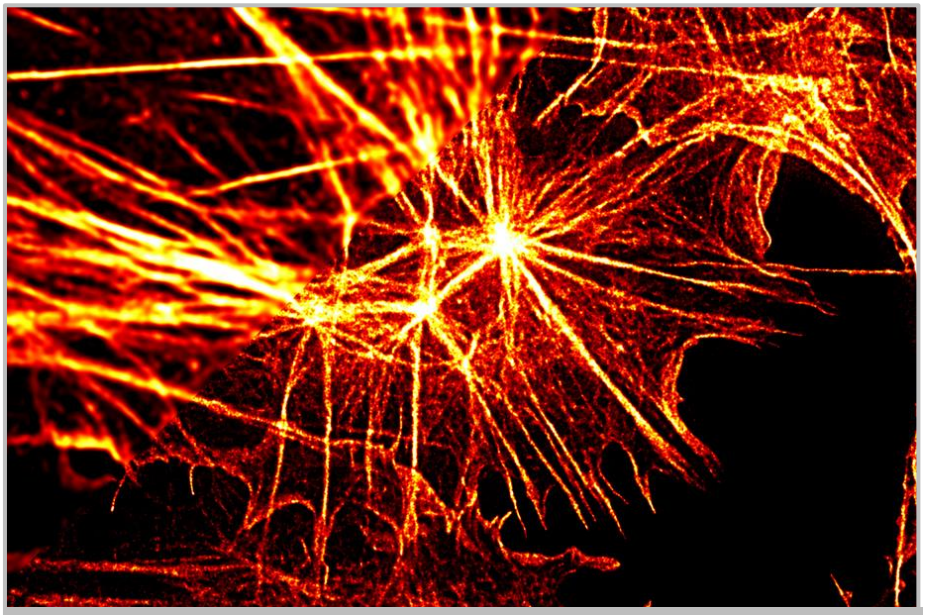
TECHNOLOGY OFFERS

Chromatic easySTED Waveplate with Wide Excitation Range (P-1312)

A segmented waveplate enables the easySTED concept for an extended range of wavelengths

EXECUTIVE SUMMARY

The invention is a segmented waveplate of at least three segments. Each segment consists of a stack of three chromatic plates. The arrangement of the waveplates enables the easySTED concept for an extended range of wavelengths as shown exemplified in the figure. The waveplates can be produced by established standard methods e.g. from quartz. The invented easySTED shaping device can realize the concept for an extended range of wavelengths compared to known devices.



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Category	Indication	Development stage	Seeking
Devices, Microscopy	----	Prototype	Licensing

BENEFITS

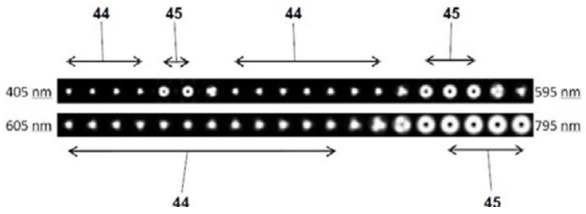
- EasySTED concept realizes STED microscopy with one source for excitation and inhibition light
- Invention achieves a larger wavelength range for easySTED
- Production of waveplates by standard methods

TECHNOLOGY BACKGROUND

In STED microscopy segmented waveplates are used to achieve a ring shaped intensity distribution for the inhibition light beam. At the same time an excitation light beam has to be centered to the ring. For an easier fitting, it is desirable for both light beams to come from one source (e.g. a single mode fibre) that is the so called easySTED-concept. In this case excitation as well as inhibition light beams have to pass the same shaping device leaving the excitation light unaffected and ring-shaping the inhibition light.

DEVELOPMENT STAGE

A prototype has been successfully tested in experiments. As the figure shows the shape of an intensity distribution of light from the light sources focused by the objective lens of the RESOLFT microscope depending on the wavelength (405nm – 795nm). 44 = spot; 45 = donut



APPLICATIONS

The invention can be used in a STED RESOLFT microscope as well as other RESOLFT or MINFLUX techniques.

INTELLECTUAL PROPERTY

Priority filing December 5th in 2016 as EP 3330764.

- The international PCT application “Segmented Birefringent Chromatic Beam Shaping Device” has been published as WO2018104126A1. Nationalized equivalents in Europe (EP3548952A1) and USA (US20190302331A1).

PUBLICATIONS & REFERENCES

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ABOUT THE DKFZ INNOVATION MANAGEMENT

Working at the interface of research and industry, the Innovation Management of the German Cancer Research Center (DKFZ) helps to get new cancer medications, diagnostic tests, and research instruments onto the market as quickly as possible.

The DKFZ with its more than 3,000 employees is the largest biomedical research institution in Germany. At the Center more than 1,300 scientists investigate how cancer develops, identify cancer risk factors and endeavor to find new strategies to prevent people from getting cancer. They develop novel approaches to make tumor diagnosis more precise and treatment of cancer patients more successful. DKFZ is a member of the Helmholtz Association of National Research Centers, with ninety percent of its funding coming from the German Federal Ministry of Education and Research and the remaining ten percent from the State of Baden-Württemberg