



## Clinical trial results:

**Wirksamkeit von Ranibizumab bei Patienten mit CHORIOIDALER NEOVASKULARISATION (CNV), als Folge einer altersbedingten Makuladegeneration (AMD), bei einer Gabe alle zwei Monate gegenüber der Behandlung bei Bedarf**

**Efficacy of Ranibizumab Treatment Every 2 Month Compared to Treatment on Demand on Patients With Choroidal Neo-vascularization (CNV) as a Consequence of Age-related Macular Degeneration (AMD) [ClinicalTrials.gov ]**

**Efficacy and safety of a fixed bimonthly ranibizumab treatment regimen in eyes with neovascular age-related macular degeneration - RABIMO trial [Paper 2017]**

## Summary

EudraCT number	2009-017324-11
Trial protocol	DE
Global end of trial date	06 August 2013

## Results information

Result version number	v1 (current)
This version publication date	05 November 2021
First version publication date	05 November 2021
Summary attachment (see zip file)	Summary results (RABIMO_O-1019_01-2-0-56C556-20131119101056.pdf)

## Trial information

### Trial identification

Sponsor protocol code	CRFB002ADE09T
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### Additional study identifiers

ISRCTN number	-
ClinicalTrials.gov id (NCT number)	NCT01831947
WHO universal trial number (UTN)	-
Other trial identifiers	RABIMO: IFS-218

Notes:

## Sponsors

Sponsor organisation name	Universitätsmedizin Göttingen (UMG), Georg-August-Universität Göttingen Stiftung Öffentlichen Rechts
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Notes:

### Paediatric regulatory details

Is trial part of an agreed paediatric investigation plan (PIP)	No
Does article 45 of REGULATION (EC) No 1901/2006 apply to this trial?	No
Does article 46 of REGULATION (EC) No 1901/2006 apply to this trial?	No

Notes:

### Results analysis stage

Analysis stage	Final
Date of interim/final analysis	10 November 2013
Is this the analysis of the primary completion data?	Yes
Primary completion date	06 August 2013
Global end of trial reached?	Yes
Global end of trial date	06 August 2013
Was the trial ended prematurely?	No

Notes:

### General information about the trial

Main objective of the trial:

Ziel der klinischen Prüfung ist die Überprüfung des Einflusses von intravitreal injiziertem Ranibizumab in unterschiedlichen Intervallen auf die Sehschärfe von Patienten mit neovaskulärer CNV im Rahmen einer AMD. Dabei erhalten alle Patienten zunächst 3 Injektionen in monatlichem Abstand und im weiteren Verlauf entweder 2-monatlich als fixes Schema oder lediglich bei Befundverschlechterung („on demand“).

Evaluation prospectively the efficacy and safety of a fixed bimonthly ranibizumab treatment regimen (RABIMO) in eyes with neovascular age-related macular degeneration (nAMD) and comparison of results with a pro re nata (PRN) treatment scheme.

Impact of injection frequency of ranibizumab on visual acuity development / BCVA - best corrected visual acuity after 12 months in comparison to baseline / ...[Paper 2017]

Protection of trial subjects:

To minimize the risk of AMD worsening in all patients, monthly assessments were introduced to identify patients for whom bi-monthly injection intervals were inadequate. [Dissertation 2017]

Background therapy: -

Evidence for comparator: -

Actual start date of recruitment	28 April 2010
Long term follow-up planned	No
Independent data monitoring committee (IDMC) involvement?	No

Notes:

## Population of trial subjects

### Subjects enrolled per country

Country: Number of subjects enrolled	Germany: 39
Worldwide total number of subjects	39
EEA total number of subjects	39

Notes:

### Subjects enrolled per age group

In utero	0
Preterm newborn - gestational age < 37 wk	0
Newborns (0-27 days)	0
Infants and toddlers (28 days-23 months)	0
Children (2-11 years)	0
Adolescents (12-17 years)	0
Adults (18-64 years)	1
From 65 to 84 years	29
85 years and over	9

## Subject disposition

### Recruitment

Recruitment details:

Recruitment period: 12 months /

First patient in: 28.04.2010 /

Last patient in: 29.03.2012

### Pre-assignment

Screening details:

Inclusion and exclusion criteria / Demographic data / Medical history / Concomitant diseases / Physical examination and vital signs / Blood count / Visual acuity / Ophthalmological examination / Optical coherence tomography (OCT) / Fundus photography Fluorescein angiography / Accompanying medication / Tonometry

### Period 1

Period 1 title	overall trial (overall period)
Is this the baseline period?	Yes
Allocation method	Randomised - controlled
Blinding used	Not blinded

### Arms

Are arms mutually exclusive?	Yes
<b>Arm title</b>	RABIMO group (randomized)

Arm description:

Experimental: Ranibizumab fixed dose / fixed bimonthly ranibizumab treatment regimen (RABIMO) / Injection of 0.5 mg Ranibizumab every 2 months for one year, following a monthly injection during the first 3 months.

Arm type	Experimental
Investigational medicinal product name	Ranibizumab
Investigational medicinal product code	
Other name	Lucentis
Pharmaceutical forms	Suspension for injection
Routes of administration	Injection

Dosage and administration details:

Ranibizumab 0.5 mg, eight injections

After three initial monthly injections, patients were randomised to receive ranibizumab bimonthly.

<b>Arm title</b>	PRN group (randomized)
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Arm description:

Experimental: Ranibizumab on demand / pro re nata (PRN) treatment scheme /

Injection of 0.5 mg Ranibizumab on demand for one year, following a monthly injection during the first 3 months.

Arm type	Experimental
Investigational medicinal product name	Ranibizumab
Investigational medicinal product code	
Other name	Lucentis
Pharmaceutical forms	Suspension for injection
Routes of administration	Injection

Dosage and administration details:

0.5 mg/eye, intravitreal injection

<b>Number of subjects in period 1</b>	<b>RABIMO group (randomized)</b>	<b>PRN group (randomized)</b>
Started	19	20
Completed	18	15
Not completed	1	5
Adverse event, serious fatal	1	2
Consent withdrawn by subject	-	1
Adverse event, non-fatal	-	2

## Baseline characteristics

### Reporting groups

Reporting group title	overall trial (overall period)
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Reporting group description: -

Reporting group values	overall trial (overall period)	Total	
Number of subjects	39	39	
Age categorical Units: Subjects			
In utero	0	0	
Preterm newborn infants (gestational age < 37 wks)	0	0	
Newborns (0-27 days)	0	0	
Infants and toddlers (28 days-23 months)	0	0	
Children (2-11 years)	0	0	
Adolescents (12-17 years)	0	0	
Adults (18-64 years)	1	1	
From 65-84 years	29	29	
85 years and over	9	9	
Gender categorical Units: Subjects			
Female	25	25	
Male	14	14	

## End points

### End points reporting groups

Reporting group title	RABIMO group (randomized)
Reporting group description: Experimental: Ranibizumab fixed dose / fixed bimonthly ranibizumab treatment regimen (RABIMO) / Injection of 0.5 mg Ranibizumab every 2 months for one year, following a monthly injection during the first 3 months.	
Reporting group title	PRN group (randomized)
Reporting group description: Experimental: Ranibizumab on demand / pro re nata (PRN) treatment scheme / Injection of 0.5 mg Ranibizumab on demand for one year, following a monthly injection during the first 3 months.	

### Primary: BCVA: best-corrected visual acuity

End point title	BCVA: best-corrected visual acuity
End point description: Impact of injection frequency on visual acuity development (best-corrected visual acuity (BCVA) after 12 months in comparison to baseline.	
End point type	Primary
End point timeframe: after 12 months (in comparison to baseline)	

End point values	RABIMO group (randomized)	PRN group (randomized)		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	19 <sup>[1]</sup>	20 <sup>[2]</sup>		
Units: interquartile range (IQR)				
median (inter-quartile range (Q1-Q3))				
significant difference in BCVA	6.5 (4 to 19)	9 (0.5 to 15.5)		

Notes:

[1] - fixed-dose / RABIMO group

[2] - pro re nata (as needed) / PRN group

<b>Attachments (see zip file)</b>	Median (IQR) BCVA.jpg
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### Statistical analyses

<b>Statistical analysis title</b>	intention to treat (ITT)
Statistical analysis description: non-inferiority design	
Comparison groups	PRN group (randomized) v RABIMO group (randomized)

Number of subjects included in analysis	39
Analysis specification	Pre-specified
Analysis type	non-inferiority <sup>[3]</sup>
P-value	< 0.0001 <sup>[4]</sup>
Method	t-test, 1-sided
Confidence interval	
level	95 %
sides	1-sided
Variability estimate	Standard deviation

Notes:

[3] - non-inferiority design for the difference  $\mu_B - \mu_2$  /

$\mu_B$ : expected value in "on-demand" group /

$\mu_2$ : expected value in "fixed dose" group /

difference between 12-month visit (visit 14) and baseline visit, under therapy

$\mu_2$  denotes the fixed 2-month injection

[4] - one-sided t-test (alpha = 5%) on the ITT



## Adverse events

### Adverse events information

Timeframe for reporting adverse events:

Adverse events were recorded during the entire study period.

Assessment type	Systematic
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### Dictionary used

Dictionary name	ICD-10
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Dictionary version	2019
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### Reporting groups

Reporting group title	PRN group
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Reporting group description: -

Reporting group title	RABIMO group
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Reporting group description: -

Serious adverse events	PRN group	RABIMO group	
Total subjects affected by serious adverse events			
subjects affected / exposed	7 / 20 (35.00%)	6 / 19 (31.58%)	
number of deaths (all causes)	2	1	
number of deaths resulting from adverse events	2	1	
Vascular disorders			
Benigne essential hypertension	Additional description: 577		
subjects affected / exposed	0 / 20 (0.00%)	1 / 19 (5.26%)	
occurrences causally related to treatment / all	0 / 0	0 / 1	
deaths causally related to treatment / all	0 / 0	0 / 0	
Stroke, not specified as haemorrhage or infarction	Additional description: 740 (Dysphasia and aphasia), sudden cardiac Death		
subjects affected / exposed	0 / 20 (0.00%)	1 / 19 (5.26%)	
occurrences causally related to treatment / all	0 / 0	0 / 1	
deaths causally related to treatment / all	0 / 0	0 / 1	
Abdominal aortic aneurysm, without mention of rupture	Additional description: 741		
subjects affected / exposed	0 / 20 (0.00%)	1 / 19 (5.26%)	
occurrences causally related to treatment / all	0 / 0	0 / 1	
deaths causally related to treatment / all	0 / 0	0 / 0	
Atherosclerosis of arteries of extremities	Additional description: 545 (left leg)		

subjects affected / exposed	1 / 20 (5.00%)	0 / 19 (0.00%)	
occurrences causally related to treatment / all	0 / 1	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Cardiac disorders			
Mitral (valve) insufficiency	Additional description: 573 (Paroxysmal atrial fibrillation)		
subjects affected / exposed	0 / 20 (0.00%)	1 / 19 (5.26%)	
occurrences causally related to treatment / all	0 / 0	0 / 1	
deaths causally related to treatment / all	0 / 0	0 / 0	
Surgical and medical procedures			
Acquired absence of leg at or below knee	Additional description: 572 (left site, amputation)		
subjects affected / exposed	1 / 20 (5.00%)	0 / 19 (0.00%)	
occurrences causally related to treatment / all	0 / 1	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Nervous system disorders			
Other transient cerebral ischaemic attacks and related syndromes	Additional description: 598		
subjects affected / exposed	0 / 20 (0.00%)	1 / 19 (5.26%)	
occurrences causally related to treatment / all	0 / 0	0 / 1	
deaths causally related to treatment / all	0 / 0	0 / 0	
Blood and lymphatic system disorders			
Lymphocyte-rich (classical) Hodgkin lymphoma	Additional description: 257, Relapse M. Hodgkin		
subjects affected / exposed	1 / 20 (5.00%)	0 / 19 (0.00%)	
occurrences causally related to treatment / all	0 / 1	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Diffuse large B-cell lymphoma	Additional description: 801 (Diffuse follicle centre lymphoma)		
subjects affected / exposed	1 / 20 (5.00%)	0 / 19 (0.00%)	
occurrences causally related to treatment / all	0 / 1	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
General disorders and administration site conditions			
Other ill-defined and unspecified causes of mortality	Additional description: 1063, Other ill-defined and unspecified causes of mortality, Death		
subjects affected / exposed	1 / 20 (5.00%)	0 / 19 (0.00%)	
occurrences causally related to treatment / all	0 / 1	0 / 0	
deaths causally related to treatment / all	0 / 1	0 / 0	
Eye disorders			

Retinal haemorrhage	Additional description: 1044		
	subjects affected / exposed	1 / 20 (5.00%)	0 / 19 (0.00%)
	occurrences causally related to treatment / all	0 / 1	0 / 0
	deaths causally related to treatment / all	0 / 0	0 / 0
Degeneration of macula and posterior pole	Additional description: 1185, 1186 (both 218_0001)		
	subjects affected / exposed	1 / 20 (5.00%)	0 / 19 (0.00%)
	occurrences causally related to treatment / all	0 / 2	0 / 0
	deaths causally related to treatment / all	0 / 0	0 / 0
Gastrointestinal disorders			
Enterocolitis due to Clostridium difficile	Additional description: 547		
	subjects affected / exposed	1 / 20 (5.00%)	0 / 19 (0.00%)
	occurrences causally related to treatment / all	0 / 1	0 / 0
	deaths causally related to treatment / all	0 / 0	0 / 0
Musculoskeletal and connective tissue disorders			
Fracture of pubis	Additional description: 537		
	subjects affected / exposed	0 / 20 (0.00%)	1 / 19 (5.26%)
	occurrences causally related to treatment / all	0 / 0	0 / 1
	deaths causally related to treatment / all	0 / 0	0 / 0
Osteomyelitis of vertebra	Additional description: 497, cervical, Discitis, unspecified (spondylodiscitis V2-3, V3-4)		
	subjects affected / exposed	1 / 20 (5.00%)	0 / 19 (0.00%)
	occurrences causally related to treatment / all	0 / 1	0 / 0
	deaths causally related to treatment / all	0 / 0	0 / 0
Pyogenic arthritis, unspecified	Additional description: 550 (knee)		
	subjects affected / exposed	1 / 20 (5.00%)	0 / 19 (0.00%)
	occurrences causally related to treatment / all	0 / 1	0 / 0
	deaths causally related to treatment / all	0 / 0	0 / 0
Infections and infestations			
Influenza, virus not identified	Additional description: 943, severe infection, (Urinary tract infection, site not specified)		
	subjects affected / exposed	0 / 20 (0.00%)	1 / 19 (5.26%)
	occurrences causally related to treatment / all	0 / 0	0 / 1
	deaths causally related to treatment / all	0 / 0	0 / 0
Conjunctivitis due to adenovirus	Additional description: 417 worsening of infectious keratitis		

subjects affected / exposed	1 / 20 (5.00%)	0 / 19 (0.00%)	
occurrences causally related to treatment / all	0 / 1	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Systemic Inflammatory Response Syndrome of infectious origin with organ failure	Additional description: 599, Septic shock, Cardiac arrest, unspecified, Death		
subjects affected / exposed	1 / 20 (5.00%)	0 / 19 (0.00%)	
occurrences causally related to treatment / all	0 / 1	0 / 0	
deaths causally related to treatment / all	0 / 1	0 / 0	
Syncope and collapse	Additional description: 922 (Other infectious diseases)		
subjects affected / exposed	1 / 20 (5.00%)	0 / 19 (0.00%)	
occurrences causally related to treatment / all	0 / 1	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	

Frequency threshold for reporting non-serious adverse events: 0.05 %

<b>Non-serious adverse events</b>	PRN group	RABIMO group	
Total subjects affected by non-serious adverse events			
subjects affected / exposed	9 / 20 (45.00%)	13 / 19 (68.42%)	
Vascular disorders			
Essential (primary) hypertension	Additional description: 297, 546 progression) (both 218_0002)		
subjects affected / exposed	0 / 20 (0.00%)	1 / 19 (5.26%)	
occurrences (all)	0	2	
Cardiac disorders			
Paroxysmal atrial fibrillation	Additional description: 700 (tachycardiac arrhythmia)		
subjects affected / exposed	1 / 20 (5.00%)	0 / 19 (0.00%)	
occurrences (all)	1	0	
Nervous system disorders			
Restlessness and agitation	Additional description: 1123		
subjects affected / exposed	1 / 20 (5.00%)	0 / 19 (0.00%)	
occurrences (all)	1	0	
Blood and lymphatic system disorders			
Other iron deficiency anaemias	Additional description: 1205		
subjects affected / exposed	0 / 20 (0.00%)	1 / 19 (5.26%)	
occurrences (all)	0	1	
Eye disorders			

Blepharitis	Additional description: 1046, 1083, 1045, 1047, 1165	
subjects affected / exposed	2 / 20 (10.00%)	3 / 19 (15.79%)
occurrences (all)	2	3
Conjunctival haemorrhage	Additional description: 1043 (up, resorption), 1064, 1042 (down, temporal)	
subjects affected / exposed	2 / 20 (10.00%)	1 / 19 (5.26%)
occurrences (all)	2	1
Corneal ulcer	Additional description: 538	
subjects affected / exposed	0 / 20 (0.00%)	1 / 19 (5.26%)
occurrences (all)	0	1
Hereditary corneal dystrophies	Additional description: 781	
subjects affected / exposed	0 / 20 (0.00%)	1 / 19 (5.26%)
occurrences (all)	0	1
Other disorders of choroid	Additional description: 983	
subjects affected / exposed	0 / 20 (0.00%)	1 / 19 (5.26%)
occurrences (all)	0	1
Degeneration of macula and posterior pole	Additional description: 842	
subjects affected / exposed	0 / 20 (0.00%)	1 / 19 (5.26%)
occurrences (all)	0	1
Other degeneration of macula and posterior pole	Additional description: 822	
subjects affected / exposed	0 / 20 (0.00%)	1 / 19 (5.26%)
occurrences (all)	0	1
Peripheral retinal degeneration	Additional description: 862 (defects)	
subjects affected / exposed	1 / 20 (5.00%)	0 / 19 (0.00%)
occurrences (all)	1	0
Separation of retinal layers	Additional description: 982 (RPE separation)	
subjects affected / exposed	0 / 20 (0.00%)	1 / 19 (5.26%)
occurrences (all)	0	1
Retinal disorder, unspecified	Additional description: 1103 (RPE abnormalities, down)	
subjects affected / exposed	0 / 20 (0.00%)	1 / 19 (5.26%)
occurrences (all)	0	1
Other vitreous opacities	Additional description: 823, 942, 1166	
subjects affected / exposed	0 / 20 (0.00%)	3 / 19 (15.79%)
occurrences (all)	0	3
Ocular pain	Additional description: 551	

subjects affected / exposed occurrences (all)	0 / 20 (0.00%) 0	1 / 19 (5.26%) 1	
Respiratory, thoracic and mediastinal disorders			
Pleural effusion, not elsewhere classified			
subjects affected / exposed	1 / 20 (5.00%)	0 / 19 (0.00%)	
occurrences (all)	1	0	
Cough	Additional description: 1003 (after fluorescence angiography)		
subjects affected / exposed	1 / 20 (5.00%)	0 / 19 (0.00%)	
occurrences (all)	1	0	
Psychiatric disorders			
Other depressive episodes	Additional description: 882		
subjects affected / exposed	0 / 20 (0.00%)	1 / 19 (5.26%)	
occurrences (all)	0	1	
Endocrine disorders			
Generalized hyperhidrosis	Additional description: 883, Ectopic hormone secretion, not elsewhere classified (increased sweating / hormones liver )		
subjects affected / exposed	0 / 20 (0.00%)	1 / 19 (5.26%)	
occurrences (all)	0	1	
Musculoskeletal and connective tissue disorders			
Other dorsalgia	Additional description: 457, 802		
subjects affected / exposed	1 / 20 (5.00%)	1 / 19 (5.26%)	
occurrences (all)	1	1	
Osseous and subluxation stenosis of intervertebral foramina	Additional description: 1023		
subjects affected / exposed	0 / 20 (0.00%)	1 / 19 (5.26%)	
occurrences (all)	0	1	
Localized oedema	Additional description: 517 (Ankle, both sides)		
subjects affected / exposed	1 / 20 (5.00%)	0 / 19 (0.00%)	
occurrences (all)	1	0	
Fracture of thoracic vertebra	Additional description: 660 (thoracic vertebra 12)		
subjects affected / exposed	1 / 20 (5.00%)	0 / 19 (0.00%)	
occurrences (all)	1	0	
Injury of Achilles tendon	Additional description: 541 (left site)		
subjects affected / exposed	1 / 20 (5.00%)	0 / 19 (0.00%)	
occurrences (all)	1	0	
Infections and infestations			

Zoster without complication subjects affected / exposed occurrences (all)	Additional description: 1022		
	0 / 20 (0.00%) 0	1 / 19 (5.26%) 1	
nasopharyngitis [common cold] subjects affected / exposed occurrences (all)	Additional description: 574, 600, 1002		
	1 / 20 (5.00%) 1	2 / 19 (10.53%) 2	
Acute upper respiratory infections of multiple and unspecified sites subjects affected / exposed occurrences (all)	Additional description: 620		
	1 / 20 (5.00%) 1	0 / 19 (0.00%) 0	
Pneumonia, unspecified subjects affected / exposed occurrences (all)	Additional description: 720		
	0 / 20 (0.00%) 0	1 / 19 (5.26%) 1	
Bronchitis, not specified as acute or chronic subjects affected / exposed occurrences (all)	Additional description: 761, 544, 640		
	1 / 20 (5.00%) 1	2 / 19 (10.53%) 2	

## More information

### Substantial protocol amendments (globally)

Were there any global substantial amendments to the protocol? Yes

Date	Amendment
08 April 2010	Protocol Version 1.3 and ICF modification

Notes:

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### Interruptions (globally)

Were there any global interruptions to the trial? No

### Limitations and caveats

None reported

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### Online references

<http://www.ncbi.nlm.nih.gov/pubmed/28102456>