Clinical trial results:
Phase II study of preliminary diagnostic performance of [68Ga]-NeoBOMB1 in adult patients with malignancies known to overexpress Gastrin Releasing Peptide Receptor

Summary

EudraCT number	2017-003432-37
Trial protocol	AT
Global end of trial date	05 July 2019

Results information

Result version number	v1
This version publication date	19 July 2020
First version publication date	19 July 2020

Trial information

Trial identification

Sponsor protocol code	A005D-E01-201

Additional study identifiers

ISRCTN number	-
ClinicalTrials.gov id (NCT number)	NCT03724253
WHO universal trial number (UTN)	-
Other trial identifiers	CAAA503A12201: Novartis

Notes:

Sponsors

Sponsor organisation name	Advanced Accelerator Applications SA
Sponsor organisation address	20, rue Diesel, Saint-Genis Pouilly, France, 01630
Public contact	Novartis Clinical Disclosure Office, Advanced Accelerator Applications SA, 41 613241111, Novartis.email@novartis.com
Scientific contact	Novartis Clinical Disclosure Office, Advanced Accelerator Applications SA, 41 613241111, Novartis.email@novartis.com

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	05 July 2019
Is this the analysis of the primary completion data?	No

Global end of trial reached?	Yes
Global end of trial date	05 July 2019
Was the trial ended prematurely?	Yes

Notes:

General information about the trial

Main objective of the trial:

The primary objective was to characterize preliminary targeting properties of [68Ga]-NeoBOMB1 in patients with malignancies known to overexpress Gastrin Releasing Peptide Receptor (GRPR).

Due to EudraCT system limitations, which EMA is aware of, data using 999 as data points in this record are not an accurate representation of the clinical trial results. Please use https://www.novctrd.com/CtrdWeb/home.novfor complete trial results.

Protection of trial subjects:

The study was in compliance with the ethical principles derived from the Declaration of Helsinki and the International Conference on Harmonization (ICH) Good Clinical Practice (GCP) guidelines. All the local regulatory requirements pertinent to safety of trial subjects were also followed during the conduct of the trial.

Background therapy: -

Evidence for comparator: -

Actual start date of recruitment	03 July 2018
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	Austria: 8
Country: Number of subjects enrolled	France: 11
Worldwide total number of subjects	19
EEA total number of subjects	19

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)	10
From 65 to 84 years	9
85 years and over	0

Subject disposition

Recruitment

Recruitment details:

This study was conducted at 4 centers in 3 countries: Austria (1), France (2) and the Netherlands (1). The site in The Netherlands was activated, but did not recruit subjects.

Pre-assignment

Screening details:

A total of 50 subjects were planned for the study (10 subjects for the dosimetry group and 40 subjects for the non dosimetry group). In total, 22 subjects were screened for eligibility and 19 subjects were enrolled (2 subjects in the dosimetry group and 17 subjects in the non dosimetry group).

Period 1

Period 1 title	Overall Study (overall period)
Is this the baseline period?	Yes
Allocation method	Non-randomised - controlled
Blinding used	Not blinded

Arms

Are arms mutually exclusive?	Yes
Arm title	Breast

Arm description:

All eligible participants were to receive recommended dose of [68Ga]-NeoBOMB1 of 3 Mega Becquerel (MBq)/Kg (+/- 10%) [but not more than 250 and not less than 150 MBq. The maximum peptide mass administered was 50 microgram (µg)].

Arm type	Experimental
Investigational medicinal product name	[68Ga]-NeoBOMB1
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Kit for radiopharmaceutical preparation
Routes of administration	Intravenous use

Dosage and administration details:

All eligible participants were to receive recommended dose of [68Ga]-NeoBOMB1 of 3 Mega Becquerel (MBq)/Kg (+/- 10%) [but not more than 250 and not less than 150 MBq. The maximum peptide mass administered was 50 microgram (µg)]

Arm title	Prostate

Arm description:

All eligible participants were to receive recommended dose of [68Ga]-NeoBOMB1 of 3 Mega Becquerel (MBq)/Kg (+/- 10%) [but not more than 250 and not less than 150 MBq. The maximum peptide mass administered was 50 microgram (µg)].

Arm type	Experimental
Investigational medicinal product name	[68Ga]-NeoBOMB1
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Kit for radiopharmaceutical preparation
Routes of administration	Intravenous use

Dosage and administration details:

All eligible participants were to receive recommended dose of [68Ga]-NeoBOMB1 of 3 Mega Becquerel (MBq)/Kg (+/- 10%) [but not more than 250 and not less than 150 MBq. The maximum peptide mass administered was 50 microgram (µg)]

Arm title	Colorectal

Arm description:

All eligible participants were to receive recommended dose of [68Ga]-NeoBOMB1 of 3 Mega Becquerel (MBq)/Kg (+/- 10%) [but not more than 250 and not less than 150 MBq. The maximum peptide mass

administered was 50 microgram (µg)].

Arm type	Experimental
Investigational medicinal product name	[68Ga]-NeoBOMB1
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Kit for radiopharmaceutical preparation
Routes of administration	Intravenous use

Dosage and administration details:

All eligible participants were to receive recommended dose of [68Ga]-NeoBOMB1 of 3 Mega Becquerel (MBq)/Kg (+/- 10%) [but not more than 250 and not less than 150 MBq. The maximum peptide mass administered was 50 microgram (µg)]

Arm title	Non-Small Cell Lung Cancer (NSCLC)

Arm description:

All eligible participants were to receive recommended dose of [68Ga]-NeoBOMB1 of 3 Mega Becquerel (MBq)/Kg (+/- 10%) [but not more than 250 and not less than 150 MBq. The maximum peptide mass administered was 50 microgram (µg)].

Arm type	Experimental
Investigational medicinal product name	[68Ga]-NeoBOMB1
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Kit for radiopharmaceutical preparation
Routes of administration	Intravenous use

Dosage and administration details:

All eligible participants were to receive recommended dose of [68Ga]-NeoBOMB1 of 3 Mega Becquerel (MBq)/Kg (+/- 10%) [but not more than 250 and not less than 150 MBq. The maximum peptide mass administered was 50 microgram (µg)]

Arm title	Small-Cell Lung Cancer (SCLC)

Arm description:

All eligible participants were to receive recommended dose of [68Ga]-NeoBOMB1 of 3 Mega Becquerel (MBq)/Kg (+/- 10%) [but not more than 250 and not less than 150 MBq. The maximum peptide mass administered was 50 microgram (µg)].

Arm type	Experimental
Investigational medicinal product name	[68Ga]-NeoBOMB1
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Kit for radiopharmaceutical preparation
Routes of administration	Intravenous use

Dosage and administration details:

All eligible participants were to receive recommended dose of [68Ga]-NeoBOMB1 of 3 Mega Becquerel (MBq)/Kg (+/- 10%) [but not more than 250 and not less than 150 MBq. The maximum peptide mass administered was 50 microgram (µg)]

Number of subjects in period 1	Breast	Prostate	Colorectal
Started	5	5	5
Completed	5	5	5

Number of subjects in period 1	Non-Small Cell Lung Cancer (NSCLC)	Small-Cell Lung Cancer (SCLC)
Started	3	1

Completed	3	1

Baseline characteristics

Reporting groups	
Reporting group title	Breast
Reporting group description:	
All eligible participants were to receive recommended dose of [68Ga]-NeoBOMB1 of 3 Mega Becquerel (MBq)/Kg (+/- 10%) [but not more than 250 and not less than 150 MBq. The maximum peptide mass administered was 50 microgram (µg)].	
Reporting group title	Prostate
Reporting group description:	
All eligible participants were to receive recommended dose of [68Ga]-NeoBOMB1 of 3 Mega Becquerel (MBq)/Kg (+/- 10%) [but not more than 250 and not less than 150 MBq. The maximum peptide mass administered was 50 microgram (µg)].	
Reporting group title	Colorectal
Reporting group description:	
All eligible participants were to receive recommended dose of [68Ga]-NeoBOMB1 of 3 Mega Becquerel (MBq)/Kg (+/- 10%) [but not more than 250 and not less than 150 MBq. The maximum peptide mass administered was 50 microgram (µg)].	
Reporting group title	Non-Small Cell Lung Cancer (NSCLC)
Reporting group description:	
All eligible participants were to receive recommended dose of [68Ga]-NeoBOMB1 of 3 Mega Becquerel (MBq)/Kg (+/- 10%) [but not more than 250 and not less than 150 MBq. The maximum peptide mass administered was 50 microgram (µg)].	
Reporting group title	Small-Cell Lung Cancer (SCLC)
Reporting group description:	
All eligible participants were to receive recommended dose of [68Ga]-NeoBOMB1 of 3 Mega Becquerel (MBq)/Kg (+/- 10%) [but not more than 250 and not less than 150 MBq. The maximum peptide mass administered was 50 microgram (µg)].	

Reporting group values	Breast	Prostate	Colorectal
Number of subjects	5	5	5
Age categorical Units: Subjects			
In utero	0	0	0
Preterm newborn infants (gestational age < 37 wks)	0	0	0
Newborns (0-27 days)	0	0	0
Infants and toddlers (28 days-23 months)	0	0	0
Children (2-11 years)	0	0	0
Adolescents (12-17 years)	0	0	0
Adults (18-64 years)	3	2	3
From 65-84 years	2	3	2
85 years and over	0	0	0
Age Continuous Units: Years			
arithmetic mean	61.8	65.4	64.2
standard deviation	± 7.60	± 6.31	± 13.68
Sex: Female, Male Units: Participants			
Female	5	0	1
Male	0	5	4

Race/Ethnicity, Customized Units: Subjects			
White	0	2	3
Not Collected	5	3	2
Diagnostic Stage			
The overall diagnostic stage uses the stage at screening visit and the Tumour, Node, Metastasis (TNM) staging uses the latest available stage.			
Units: Subjects			
Stage IIIA	0	1	0
Stage IIIC	0	0	0
Stage IV	5	4	5
Baseline Weight			
Baseline is defined as the last measurement prior to Investigational Medicinal Product (IMP) administration.			
Units: kilogram (kg)			
arithmetic mean	70.6	85.2	72.6
standard deviation	± 10.53	± 7.46	± 8.63
Baseline Height			
Baseline is defined as the last measurement prior to Investigational Medicinal Product (IMP) administration.			
Units: centimeter (cm)			
arithmetic mean	165.6	175.4	170.4
standard deviation	± 3.21	± 5.94	± 6.23
Baseline Body Mass Index			
Baseline is defined as the last measurement prior to Investigational Medicinal Product (IMP) administration.			
Units: kilogram per square metre (kg/m^2)			
arithmetic mean	25.84	27.79	24.90
standard deviation	± 4.563	± 3.202	± 1.514
Time from Initial Diagnosis of Primary Disease			
Time from initial diagnosis (months) is calculated as (date of IMP administration - date of initial diagnosis + 1)/30.4375.			
Units: Months			
arithmetic mean	117.3	50.5	24.3
standard deviation	± 64.61	± 74.48	± 25.40

Reporting group values	Non-Small Cell Lung Cancer (NSCLC)	Small-Cell Lung Cancer (SCLC)	Total
Number of subjects	3	1	19
Age categorical Units: Subjects			
In utero	0	0	0
Preterm newborn infants (gestational age < 37 wks)	0	0	0
Newborns (0-27 days)	0	0	0
Infants and toddlers (28 days-23 months)	0	0	0
Children (2-11 years)	0	0	0
Adolescents (12-17 years)	0	0	0
Adults (18-64 years)	1	1	10
From 65-84 years	2	0	9
85 years and over	0	0	0

Age Continuous			
Units: Years			
arithmetic mean	64.7	54.0	
standard deviation	± 3.21	± 999	-
Sex: Female, Male			
Units: Participants			
Female	1	1	8
Male	2	0	11
Race/Ethnicity, Customized			
Units: Subjects			
White	2	1	8
Not Collected	1	0	11
Diagnostic Stage			
The overall diagnostic stage uses the stage at screening visit and the Tumour, Node, Metastasis (TNM) staging uses the latest available stage.			
Units: Subjects			
Stage IIIA	1	0	2
Stage IIIC	1	0	1
Stage IV	1	1	16
Baseline Weight			
Baseline is defined as the last measurement prior to Investigational Medicinal Product (IMP) administration.			
Units: kilogram (kg)			
arithmetic mean	72.1	62.8	
standard deviation	± 23.38	± 999	-
Baseline Height			
Baseline is defined as the last measurement prior to Investigational Medicinal Product (IMP) administration.			
Units: centimeter (cm)			
arithmetic mean	165.7	168.0	
standard deviation	± 3.51	± 999	-
Baseline Body Mass Index			
Baseline is defined as the last measurement prior to Investigational Medicinal Product (IMP) administration.			
Units: kilogram per square metre (kg/m^2)			
arithmetic mean	26.04	22.25	
standard deviation	± 7.552	± 999	-
Time from Initial Diagnosis of Primary Disease			
Time from initial diagnosis (months) is calculated as (date of IMP administration - date of initial diagnosis + 1)/30.4375.			
Units: Months			
arithmetic mean	1.6	1.1	
standard deviation	± 1.46	± 999	-

End points

End points reporting groups

Reporting group title	Breast
Reporting group description:	
All eligible participants were to receive recommended dose of [68Ga]-NeoBOMB1 of 3 Mega Becquerel (MBq)/Kg (+/- 10%) [but not more than 250 and not less than 150 MBq. The maximum peptide mass administered was 50 microgram (µg)].	
Reporting group title	Prostate
Reporting group description:	
All eligible participants were to receive recommended dose of [68Ga]-NeoBOMB1 of 3 Mega Becquerel (MBq)/Kg (+/- 10%) [but not more than 250 and not less than 150 MBq. The maximum peptide mass administered was 50 microgram (µg)].	
Reporting group title	Colorectal
Reporting group description:	
All eligible participants were to receive recommended dose of [68Ga]-NeoBOMB1 of 3 Mega Becquerel (MBq)/Kg (+/- 10%) [but not more than 250 and not less than 150 MBq. The maximum peptide mass administered was 50 microgram (µg)].	
Reporting group title	Non-Small Cell Lung Cancer (NSCLC)
Reporting group description:	
All eligible participants were to receive recommended dose of [68Ga]-NeoBOMB1 of 3 Mega Becquerel (MBq)/Kg (+/- 10%) [but not more than 250 and not less than 150 MBq. The maximum peptide mass administered was 50 microgram (µg)].	
Reporting group title	Small-Cell Lung Cancer (SCLC)
Reporting group description:	
All eligible participants were to receive recommended dose of [68Ga]-NeoBOMB1 of 3 Mega Becquerel (MBq)/Kg (+/- 10%) [but not more than 250 and not less than 150 MBq. The maximum peptide mass administered was 50 microgram (µg)].	

Primary: Number of lesions detected by [68Ga]-NeoBOMB1

End point title	Number of lesions detected by [68Ga]-NeoBOMB1[1]
End point description:	
The preliminary targeting properties of [68Ga]-NeoBOMB1 were to be assessed by summarizing the number of lesions identified by Positron Emission Tomography (PET) overall and split by GRPR positive and negative patients, as well as by tumor type. Only descriptive analysis performed.	
End point type	Primary
End point timeframe:	
[68Ga]-NeoBOMB1 PET imaging acquired at Day 1	

Notes:

[1] - No statistical analyses have been specified for this primary end point. It is expected there is at least one statistical analysis for each primary end point.
Justification: Only descriptive analysis performed.
The results of the biopsied samples for all patients were positive for GRPR and thus the presentation of results according to GRPR expression were no longer suitable.

End point values	Breast	Prostate	Colorectal	Non-Small Cell Lung Cancer (NSCLC)
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	5	5	5	3
Units: Lesion				
arithmetic mean (standard deviation)	17.0 (± 15.57)	2.2 (± 1.64)	6.0 (± 4.58)	3.3 (± 2.31)

End point values	Small-Cell Lung Cancer (SCLC)			
Subject group type	Reporting group			
Number of subjects analysed	1			
Units: Lesion				
arithmetic mean (standard deviation)	1.0 (± 999)			

Statistical analyses

No statistical analyses for this end point

Primary: Number of Participants with Lesions detected by [68Ga]-NeoBOMB1 per Location

End point title	Number of Participants with Lesions detected by [68Ga]-NeoBOMB1 per Location[2]

End point description:

The preliminary targeting properties of [68Ga]-NeoBOMB1 were to be assessed by summarizing the location of lesions identified by PET overall and split by GRPR positive and negative patients, as well as by tumor type. Only descriptive analysis performed.

End point type	Primary

End point timeframe:

[68Ga]-NeoBOMB1 PET imaging acquired at Day 1

Notes:

[2] - No statistical analyses have been specified for this primary end point. It is expected there is at least one statistical analysis for each primary end point.
Justification: Only descriptive analysis performed.
The results of the biopsied samples for all patients were positive for GRPR and thus the presentation of results according to GRPR expression were no longer suitable.

End point values	Breast	Prostate	Colorectal	Non-Small Cell Lung Cancer (NSCLC)
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	5	5	3	3
Units: No. of Participants with >= 1 lesion				
Overall	5	5	3	3
Nodal	2	1	2	3
Skeletal	4	2	0	0
Skin/Superficial	2	0	0	0
Soft Tissue/Visceral	4	4	2	3

End point values	Small-Cell Lung Cancer (SCLC)			

Subject group type	Reporting group			
Number of subjects analysed	1			
Units: No. of Participants with >= 1 lesion				
Overall	1			
Nodal	0			
Skeletal	0			
Skin/Superficial	0			
Soft Tissue/Visceral	1			

Statistical analyses

No statistical analyses for this end point

Primary: Non-Dosimetry Group: Standard Uptake Value (SUV) mean by timepoint and lesion location

End point title	Non-Dosimetry Group: Standard Uptake Value (SUV) mean by timepoint and lesion location[3]

End point description:

Targeting properties of [68Ga]-NeoBOMB1 were to be evaluated by semi-quantitatively assessing radiotracer uptake at lesion level, identified via PET Imaging. The SUVmean and SUVmax (g/mL) of each lesion were to be calculated and reported by lesion location with summary statistics at all imaging time points. SUV was to be calculated overall and split by GRPR positive and negative patients, as well as by tumor type. Only descriptive analysis performed.

End point type	Primary

End point timeframe:

[68Ga]-NeoBOMB1 PET imaging acquired at Day 1 (0.05 (only applicable for the Prostate Group), 1.50 and 2.50 hours)

Notes:

[3] - No statistical analyses have been specified for this primary end point. It is expected there is at least one statistical analysis for each primary end point.
Justification: Only descriptive analysis performed.
The results of the biopsied samples for all patients were positive for GRPR and thus the presentation of results according to GRPR expression were no longer suitable.

End point values	Breast	Prostate	Colorectal	Non-Small Cell Lung Cancer (NSCLC)
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	5	5	5	3
Units: Participants with >= 1 SUVmean meas.				
arithmetic mean (standard deviation)				
SUV mean:Overall (0.05 hours)	999 (± 999)	1.634 (± 0.8221)	999 (± 999)	999 (± 999)
SUV mean:Nodal (0.05 hours)	999 (± 999)	0.630 (± 999)	999 (± 999)	999 (± 999)
SUV mean:Skeletal (0.05 hours)	999 (± 999)	1.890 (± 999)	999 (± 999)	999 (± 999)
SUV mean:Skin/Superficial (0.05 hours)	999 (± 999)	999 (± 999)	999 (± 999)	999 (± 999)
SUV mean:Soft Tissue/Visceral (0.05 hours)	999 (± 999)	1.558 (± 0.9517)	999 (± 999)	999 (± 999)
SUV mean:Overall (1.50 hours)	6.833 (± 5.0645)	11.638 (± 15.9172)	2.582 (± 0.8142)	1.560 (± 0.4468)
SUV mean:Nodal (1.50 hours)	4.720 (± 5.4447)	1.080 (± 0.2263)	1.700 (± 0.3960)	1.560 (± 0.4468)

SUV mean:Skeletal (1.50 hours)	3.670 (± 4.0164)	1.470 (± 0.7778)	999 (± 999)	999 (± 999)
SUV mean:Skin/Superficial (1.50 hours)	4.370 (± 999)	999 (± 999)	0.560 (± 999)	999 (± 999)
SUV mean:Soft Tissue/Visceral (1.50 hours)	6.833 (± 5.0645)	14.043 (± 17.2993)	2.582 (± 0.8142)	1.427 (± 0.4274)
SUV mean:Overall (2.50 hours)	6.903 (± 5.4174)	9.088 (± 10.7319)	2.258 (± 0.9105)	1.273 (± 0.2386)
SUV mean:Nodal (2.50 hours)	4.900 (± 6.0528)	0.800 (± 0.2687)	2.715 (± 1.5344)	1.273 (± 0.2386)
SUV mean:Skeletal (2.50 hours)	3.685 (± 4.4336)	1.455 (± 0.8415)	999 (± 999)	999 (± 999)
SUV mean:Skin/Superficial (2.50 hours)	4.360 (± 999)	999 (± 999)	0.450 (± 999)	999 (± 999)
SUV mean:Soft Tissue/Visceral (2.50 hours)	6.903 (± 5.4174)	10.848 (± 11.5294)	2.060 (± 0.5115)	1.193 (± 0.3250)

End point values	Small-Cell Lung Cancer (SCLC)			
Subject group type	Reporting group			
Number of subjects analysed	1			
Units: Participants with >= 1 SUVmean meas.				
arithmetic mean (standard deviation)				
SUV mean:Overall (0.05 hours)	999 (± 999)			
SUV mean:Nodal (0.05 hours)	999 (± 999)			
SUV mean:Skeletal (0.05 hours)	999 (± 999)			
SUV mean:Skin/Superficial (0.05 hours)	999 (± 999)			
SUV mean:Soft Tissue/Visceral (0.05 hours)	999 (± 999)			
SUV mean:Overall (1.50 hours)	1.250 (± 999)			
SUV mean:Nodal (1.50 hours)	1.250 (± 999)			
SUV mean:Skeletal (1.50 hours)	999 (± 999)			
SUV mean:Skin/Superficial (1.50 hours)	999 (± 999)			
SUV mean:Soft Tissue/Visceral (1.50 hours)	1.150 (± 999)			
SUV mean:Overall (2.50 hours)	0.850 (± 999)			
SUV mean:Nodal (2.50 hours)	0.850 (± 999)			
SUV mean:Skeletal (2.50 hours)	999 (± 999)			
SUV mean:Skin/Superficial (2.50 hours)	999 (± 999)			
SUV mean:Soft Tissue/Visceral (2.50 hours)	0.710 (± 999)			

Statistical analyses

No statistical analyses for this end point

Primary: Non-Dosimetry Group: Standard Uptake Value (SUV) max by timepoint and lesion location

End point title	Non-Dosimetry Group: Standard Uptake Value (SUV) max by timepoint and lesion location[4]

End point description:

Targeting properties of [68Ga]-NeoBOMB1 were to be evaluated by semi-quantitatively assessing radiotracer uptake at lesion level, identified via PET Imaging. The SUVmean and SUVmax (g/mL) of each lesion were to be calculated and reported by lesion location with summary statistics at all imaging time points. SUV was to be calculated overall and split by GRPR positive and negative patients, as well as by tumor type. Only descriptive analysis performed.

End point type	Primary

End point timeframe:

[68Ga]-NeoBOMB1 PET imaging acquired at Day 1 (0.05 (only applicable for the Prostate Group), 1.50 and 2.50 hours)

Notes:

[4] - No statistical analyses have been specified for this primary end point. It is expected there is at least one statistical analysis for each primary end point.
Justification: Only descriptive analysis performed.
The results of the biopsied samples for all patients were positive for GRPR and thus the presentation of results according to GRPR expression were no longer suitable.

End point values	Breast	Prostate	Colorectal	Non-Small Cell Lung Cancer (NSCLC)
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	5	5	5	3
Units: Participants with >= 1 SUVmax meas.				
arithmetic mean (standard deviation)				
SUV max:Overall (0.05 hours)	999 (± 999)	2.166 (± 1.1164)	999 (± 999)	999 (± 999)
SUV max:Nodal (0.05 hours)	999 (± 999)	0.880 (± 999)	999 (± 999)	999 (± 999)
SUV max:Skeletal (0.05 hours)	999 (± 999)	2.480 (± 999)	999 (± 999)	999 (± 999)
SUV max:Skin/Superficial (0.05 hours)	999 (± 999)	999 (± 999)	999 (± 999)	999 (± 999)
SUV max:Soft Tissue/Visceral (0.05 hours)	999 (± 999)	2.088 (± 1.2731)	999 (± 999)	999 (± 999)
SUV max:Overall (1.50 hours)	19.040 (± 17.5106)	17.326 (± 24.2165)	3.570 (± 0.7504)	2.097 (± 0.6863)
SUV max:Nodal (1.50 hours)	9.070 (± 11.3986)	1.505 (± 0.4313)	2.090 (± 0.5233)	1.917 (± 0.7139)
SUV max:Skeletal (1.50 hours)	10.325 (± 13.0461)	2.135 (± 0.9687)	999 (± 999)	999 (± 999)
SUV max:Skin/Superficial (1.50 hours)	7.400 (± 999)	999 (± 999)	0.750 (± 999)	999 (± 999)
SUV max:Soft Tissue/Visceral (1.50 hours)	18.580 (± 17.5086)	20.953 (± 26.3485)	3.570 (± 0.7504)	2.097 (± 0.6863)
SUV max:Overall (2.50 hours)	23.120 (± 19.7908)	14.544 (± 18.4921)	2.890 (± 0.5866)	2.050 (± 0.8314)
SUV max:Nodal (2.50 hours)	10.440 (± 13.8169)	1.305 (± 0.3323)	2.870 (± 1.3859)	1.783 (± 0.6676)
SUV max:Skeletal (2.50 hours)	15.475 (± 20.9091)	2.115 (± 1.0677)	999 (± 999)	999 (± 999)
SUV max:Skin/Superficial (2.50 hours)	7.950 (± 999)	999 (± 999)	0.600 (± 999)	999 (± 999)
SUV max:Soft Tissue/Visceral (2.50 hours)	22.140 (± 19.3278)	17.463 (± 19.9790)	2.890 (± 0.5866)	2.000 (± 0.8982)

End point values	Small-Cell Lung Cancer (SCLC)			
Subject group type	Reporting group			
Number of subjects analysed	1			

Units: Participants with >= 1 SUVmax meas.				
arithmetic mean (standard deviation)				
SUV max:Overall (0.05 hours)	999 (± 999)			
SUV max:Nodal (0.05 hours)	999 (± 999)			
SUV max:Skeletal (0.05 hours)	999 (± 999)			
SUV max:Skin/Superficial (0.05 hours)	999 (± 999)			
SUV max:Soft Tissue/Visceral (0.05 hours)	999 (± 999)			
SUV max:Overall (1.50 hours)	1.810 (± 999)			
SUV max:Nodal (1.50 hours)	1.450 (± 999)			
SUV max:Skeletal (1.50 hours)	999 (± 999)			
SUV max:Skin/Superficial (1.50 hours)	999 (± 999)			
SUV max:Soft Tissue/Visceral (1.50 hours)	1.810 (± 999)			
SUV max:Overall (2.50 hours)	1.390 (± 999)			
SUV max:Nodal (2.50 hours)	1.180 (± 999)			
SUV max:Skeletal (2.50 hours)	999 (± 999)			
SUV max:Skin/Superficial (2.50 hours)	999 (± 999)			
SUV max:Soft Tissue/Visceral (2.50 hours)	1.390 (± 999)			

Statistical analyses

No statistical analyses for this end point

Primary: Dosimetry Group: Standard Uptake Value (SUV) mean by timepoint and lesion location

End point title	Dosimetry Group: Standard Uptake Value (SUV) mean by timepoint and lesion location[5][6]

End point description:

Targeting properties of [68Ga]-NeoBOMB1 were to be evaluated by semi-quantitatively assessing radiotracer uptake at lesion level, identified via PET Imaging. The SUVmean and SUVmax (g/mL) of each lesion were to be calculated and reported by lesion location with summary statistics at all imaging time points. SUV was to be calculated overall and split by GRPR positive and negative patients, as well as by tumor type. Only descriptive analysis performed.

End point type	Primary

End point timeframe:

[68Ga]-NeoBOMB1 PET imaging acquired at Day 1 (0.15, 1.00, 2.00 and 4.00 hours)

Notes:

[5] - No statistical analyses have been specified for this primary end point. It is expected there is at least one statistical analysis for each primary end point.
Justification: Only descriptive analysis performed.
The results of the biopsied samples for all patients were positive for GRPR and thus the presentation of results according to GRPR expression were no longer suitable.
[6] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Dosimetry analysis only apply to subset of Breast Cancer patients

End point values	Breast			
Subject group type	Reporting group			
Number of subjects analysed	2			
Units: Participants with >= 1 SUVmean meas.				
arithmetic mean (standard deviation)				
SUV mean:Overall (0.15 hours)	5.615 (± 5.1265)			
SUV mean:Nodal (0.15 hours)	2.565 (± 1.0394)			
SUV mean:Skeletal (0.15 hours)	2.140 (± 0.2121)			
SUV mean:Skin/Superficial (0.15 hours)	1.250 (± 999)			
SUV mean:Soft Tissue/Visceral (0.15 hours)	9.240 (± 999)			
SUV mean:Overall (1.00 hours)	4.840 (± 5.1336)			
SUV mean:Nodal (1.00 hours)	2.035 (± 1.1667)			
SUV mean:Skeletal (1.00 hours)	1.935 (± 1.2233)			
SUV mean:Skin/Superficial (1.00 hours)	1.520 (± 999)			
SUV mean:Soft Tissue/Visceral (1.00 hours)	8.470 (± 999)			
SUV mean:Overall (2.00 hours)	4.935 (± 5.4659)			
SUV mean:Nodal (2.00 hours)	1.865 (± 1.1667)			
SUV mean:Skeletal (2.00 hours)	1.635 (± 0.7990)			
SUV mean:Skin/Superficial (2.00 hours)	1.650 (± 999)			
SUV mean:Soft Tissue/Visceral (2.00 hours)	8.800 (± 999)			
SUV mean:Overall (4.00 hours)	5.105 (± 5.7064)			
SUV mean:Nodal (4.00 hours)	1.475 (± 1.0819)			
SUV mean:Skeletal (4.00 hours)	1.930 (± 1.2162)			
SUV mean:Skin/Superficial (4.00 hours)	1.100 (± 999)			
SUV mean:Soft Tissue/Visceral (4.00 hours)	9.140 (± 999)			

Statistical analyses

No statistical analyses for this end point

Primary: Dosimetry Group: Standard Uptake Value (SUV) max by timepoint and lesion location

End point title	Dosimetry Group: Standard Uptake Value (SUV) max by timepoint and lesion location[7][8]

End point description:

Targeting properties of [68Ga]-NeoBOMB1 were to be evaluated by semi-quantitatively assessing radiotracer uptake at lesion level, identified via PET Imaging. The SUVmean and SUVmax (g/mL) of each

lesion were to be calculated and reported by lesion location with summary statistics at all imaging time points. SUV was to be calculated overall and split by GRPR positive and negative patients, as well as by tumor type. Only descriptive analysis performed.

End point type	Primary

End point timeframe:

[68Ga]-NeoBOMB1 PET imaging acquired at Day 1 (0.15, 1.00, 2.00 and 4.00 hours)

Notes:

[7] - No statistical analyses have been specified for this primary end point. It is expected there is at least one statistical analysis for each primary end point.
Justification: Only descriptive analysis performed.
The results of the biopsied samples for all patients were positive for GRPR and thus the presentation of results according to GRPR expression were no longer suitable.
[8] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Dosimetry analysis only apply to subset of Breast Cancer patients

End point values	Breast			
Subject group type	Reporting group			
Number of subjects analysed	2			
Units: Participants with >= 1 SUVmax meas.				
arithmetic mean (standard deviation)				
SUV max:Overall(0.15 hours)	7.575 (± 6.7104)			
SUV max:Nodal (0.15 hours)	3.405 (± 0.8132)			
SUV max:Skeletal (0.15 hours)	2.740 (± 0.3111)			
SUV max:Skin/Superficial (0.15 hours)	1.450 (± 999)			
SUV max:Soft Tissue/Visceral (0.15 hours)	12.320 (± 999)			
SUV max:Overall (1.00 hours)	11.550 (± 13.7603)			
SUV max:Nodal (1.00 hours)	2.660 (± 1.1879)			
SUV max:Skeletal (1.00 hours)	2.595 (± 1.5203)			
SUV max:Skin/Superficial (1.00 hours)	1.750 (± 999)			
SUV max:Soft Tissue/Visceral (1.00 hours)	21.280 (± 999)			
SUV max:Overall (2.00 hours)	13.680 (± 17.1827)			
SUV max:Nodal (2.00 hours)	2.625 (± 1.5486)			
SUV max:Skeletal (2.00 hours)	2.445 (± 1.3081)			
SUV max:Skin/Superficial (2.00 hours)	2.080 (± 999)			
SUV max:Soft Tissue/Visceral (2.00 hours)	25.830 (± 999)			
SUV max:Overall (4.00 hours)	13.950 (± 17.5787)			
SUV max:Nodal (4.00 hours)	2.050 (± 1.3011)			
SUV max:Skeletal (4.00 hours)	3.205 (± 2.3829)			
SUV max:Skin/Superficial (4.00 hours)	1.640 (± 999)			
SUV max:Soft Tissue/Visceral (4.00 hours)	26.380 (± 999)			

Statistical analyses

No statistical analyses for this end point

Primary: Dosimetry Group: Evaluation of percentage of injected dose reaching the target (TACs)

End point title	Dosimetry Group: Evaluation of percentage of injected dose reaching the target (TACs)[9][10]

End point description:

For patients included in the dosimetry group, the percentage of injected dose reaching source organs and tumor lesions was to be calculated using the acquired PET images at each time point. The resulting TACs were to be summarized descriptively.

End point type	Primary

End point timeframe:

[68Ga]-NeoBOMB1 PET imaging acquired at Day 1 (0.15, 1.00, 2.00 and 4.00 hours)

Notes:

[9] - No statistical analyses have been specified for this primary end point. It is expected there is at least one statistical analysis for each primary end point.
Justification: Due to the sample size in the dosimetry group (2 patients), summary statistics were not performed.
[10] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Dosimetry analysis only apply to subset of Breast Cancer patients

End point values	Breast			
Subject group type	Reporting group			
Number of subjects analysed	2			
Units: Injected dose	999			

Statistical analyses

No statistical analyses for this end point

Secondary: Treatment Emergent Adverse Events profile

End point title	Treatment Emergent Adverse Events profile

End point description:

Treatment-emergent adverse events (TEAEs) were collected from first dosing (single administration, Day 1) up to last follow-up visit or until the event has resolved to baseline grade or better or the event was assessed stable by the investigator or the patient was lost to follow-up or withdrew consent. The distribution of adverse events was done via the analysis of frequencies for treatment emergent Adverse Event (TEAEs), Grade 3/4/5 TEAEs, Serious Adverse Event TEAEs, Interruption of [68Ga]-NeoBOMB1 Due to Any TEAEs and Deaths due to AEs, through the monitoring of relevant clinical and laboratory safety parameters. Only descriptive analysis performed.

End point type	Secondary

End point timeframe:

From first dosing (single administration, Day 1) up to last follow-up visit or until the event has resolved to baseline grade or better or the event was assessed stable by the investigator or the patient was lost to follow-up or withdrew consent.

End point values	Breast	Prostate	Colorectal	Non-Small Cell Lung Cancer (NSCLC)
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	5	5	5	3
Units: Participants				
Treatment-Emergent Adverse Events (TEAEs)	0	1	3	3
IMP-Related TEAEs	0	0	0	0
Grade 3/4/5 TEAEs	0	0	0	0
IMP-Related Grade 3/4/5 TEAEs	0	0	0	0
Serious TEAEs	0	0	0	0
IMP-Related Serious TEAEs	0	0	0	0
TEAEs Interruption of [68Ga]-NeoBOMB1	0	0	0	0
IMP-Related TEAEs Interruption of [68Ga]-NeoBOMB1	0	0	0	0
Deaths Due to AEs	0	0	0	0

End point values	Small-Cell Lung Cancer (SCLC)			
Subject group type	Reporting group			
Number of subjects analysed	1			
Units: Participants				
Treatment-Emergent Adverse Events (TEAEs)	1			
IMP-Related TEAEs	0			
Grade 3/4/5 TEAEs	1			
IMP-Related Grade 3/4/5 TEAEs	0			
Serious TEAEs	1			
IMP-Related Serious TEAEs	0			
TEAEs Interruption of [68Ga]-NeoBOMB1	0			
IMP-Related TEAEs Interruption of [68Ga]-NeoBOMB1	0			
Deaths Due to AEs	0			

Statistical analyses

No statistical analyses for this end point

Secondary: Number of lesions detected by Conventional Imaging

End point title	Number of lesions detected by Conventional Imaging

End point description:

The preliminary targeting properties of [68Ga]-NeoBOMB1 were to be assessed by summarizing the number of lesions identified by Positron Emission Tomography (PET) overall and split by GRPR positive and negative patients, as well as by tumor type. The number of lesions identified by aforementioned PET imaging were to be compared with the number of lesions identified by the comparable conventional imaging. Only descriptive analysis performed.

End point type	Secondary

End point timeframe:

Conventional imaging collected within 3 months prior to study entry up to [68Ga]-NeoBOMB1 PET imaging acquired at Day 1

End point values	Breast	Prostate	Colorectal	Non-Small Cell Lung Cancer (NSCLC)
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	5	5	5	3
Units: Lesion				
arithmetic mean (standard deviation)	18.4 (± 15.81)	13.8 (± 21.51)	12.2 (± 9.86)	10.0 (± 7.55)

End point values	Small-Cell Lung Cancer (SCLC)			
Subject group type	Reporting group			
Number of subjects analysed	1			
Units: Lesion				
arithmetic mean (standard deviation)	2.0 (± 999)			

Statistical analyses

No statistical analyses for this end point

Secondary: Number of Participants with Lesions detected by Conventional imaging per Location

End point title	Number of Participants with Lesions detected by Conventional imaging per Location

End point description:

The preliminary targeting properties of [68Ga]-NeoBOMB1 were to be assessed by summarizing the location of lesions identified by PET overall and split by GRPR positive and negative patients, as well as by tumor type. The location of lesions identified by aforementioned PET imaging were to be compared with the location of lesions identified by the comparable conventional imaging. Only descriptive analysis performed.

End point type	Secondary

End point timeframe:

Conventional imaging collected within 3 months prior to study entry up to [68Ga]-NeoBOMB1 PET imaging acquired at Day 1

End point values	Breast	Prostate	Colorectal	Non-Small Cell Lung Cancer (NSCLC)
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	5	5	5	3
Units: No. of Participants with >= 1 lesion				
Overall	5	5	5	3
Nodal	4	1	2	3
Skeletal	4	2	0	0
Skin/Superficial	2	0	1	0
Soft Tissue/Visceral	4	4	5	3

End point values	Small-Cell Lung Cancer (SCLC)			
Subject group type	Reporting group			
Number of subjects analysed	1			
Units: No. of Participants with >= 1 lesion				
Overall	1			
Nodal	1			
Skeletal	0			
Skin/Superficial	0			
Soft Tissue/Visceral	1			

Statistical analyses

No statistical analyses for this end point

Secondary: Lesion-level analyses of diagnostics by [68Ga]-NeoBOMB1 compared with conventional imaging

End point title	Lesion-level analyses of diagnostics by [68Ga]-NeoBOMB1 compared with conventional imaging

End point description:

At lesion level, overall, positive, and negative agreement of [68Ga]-NeoBOMB1 were to be calculated based on the aforementioned tabulations as follows:
• Overall agreement = 100% x (Double positive + Double negative) / total number of lesions identified by either imaging proceduresg
• Positive agreement = 100% x Double positive / (Double positive + Comparator single positive)
• Negative agreement = 100% x Double negative / (Double negative + Comparator single negative).

End point type	Secondary

End point timeframe:

Conventional imaging collected within 3 months prior to study entry up to [68Ga]-NeoBOMB1 PET imaging acquired at Day 1

End point values	Breast	Prostate	Colorectal	Non-Small Cell Lung Cancer (NSCLC)
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	5	5	5	3
Units: Agreement on Diagnostics				
number (confidence interval 95%)				
Overall (Positive Agreement)	52.2 (41.5 to 62.7)	14.5 (7.2 to 25.0)	29.5 (18.5 to 42.6)	33.3 (17.3 to 52.8)
Overall (Overall Agreement)	37.2 (28.9 to 46.2)	14.3 (7.1 to 24.7)	29.5 (18.5 to 42.6)	33.3 (17.3 to 52.8)
Nodal (Positive Agreement)	64.3 (35.1 to 87.2)	0.0 (0.0 to 30.8)	66.7 (9.4 to 99.2)	26.9 (11.6 to 47.8)
Nodal (Overall agreement)	64.3 (35.1 to 87.2)	0.0 (0.0 to 28.5)	66.7 (9.4 to 99.2)	26.9 (11.6 to 47.8)
Skeletal (Positive Agreement)	22.9 (12.0 to 37.3)	11.1 (4.2 to 22.6)	999 (999 to 999)	999 (999 to 999)
Skeletal (Overall agreement)	18.3 (9.5 to 30.4)	11.1 (4.2 to 22.6)	999 (999 to 999)	999 (999 to 999)
Skin/Superficial (Positive Agreement)	100.0 (15.8 to 100.0)	999 (999 to 999)	0.0 (0.0 to 97.5)	999 (999 to 999)
Skin/Superficial (Overall agreement)	100.0 (15.8 to 100.0)	999 (999 to 999)	0.0 (0.0 to 97.5)	999 (999 to 999)
Soft Tissue/Visceral (Positive Agreement)	92.9 (76.5 to 99.1)	80.0 (28.4 to 99.5)	28.1 (17.0 to 41.5)	75.0 (19.4 to 99.4)
Soft Tissue/Visceral (Overall agreement)	49.1 (35.1 to 63.2)	80.0 (28.4 to 99.5)	28.1 (17.0 to 41.5)	75.0 (19.4 to 99.4)

End point values	Small-Cell Lung Cancer (SCLC)			
Subject group type	Reporting group			
Number of subjects analysed	1			
Units: Agreement on Diagnostics				
number (confidence interval 95%)				
Overall (Positive Agreement)	50.0 (1.3 to 98.7)			
Overall (Overall Agreement)	50.0 (1.3 to 98.7)			
Nodal (Positive Agreement)	0.0 (0.0 to 97.5)			
Nodal (Overall agreement)	0.0 (0.0 to 97.5)			
Skeletal (Positive Agreement)	999 (999 to 999)			
Skeletal (Overall agreement)	999 (999 to 999)			
Skin/Superficial (Positive Agreement)	999 (999 to 999)			
Skin/Superficial (Overall agreement)	999 (999 to 999)			
Soft Tissue/Visceral (Positive Agreement)	100.0 (2.5 to 100.0)			

Soft Tissue/Visceral (Overall agreement)	100.0 (2.5 to 100.0)			

Statistical analyses

No statistical analyses for this end point

Secondary: Patient-level analyses of diagnostics by [68Ga]-NeoBOMB1 compared with conventional imaging

End point title	Patient-level analyses of diagnostics by [68Ga]-NeoBOMB1 compared with conventional imaging

End point description:

At patient level, positive agreement was defined as the proportion of subjects with at least one lesion detected by conventional imaging in the specified location that also have at least one lesion detected by [68Ga]-NeoBOMB1. Overall agreement was defined as the proportion of subjects with at least one lesion detected in either imaging in the specified location that also have at least one lesion detected by [68Ga]-NeoBOMB1.

End point type	Secondary

End point timeframe:

Conventional imaging collected within 3 months prior to study entry up to [68Ga]-NeoBOMB1 PET imaging acquired at Day 1

End point values	Breast	Prostate	Colorectal	Non-Small Cell Lung Cancer (NSCLC)
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	5	5	5	3
Units: Agreement on Diagnostics				
number (confidence interval 95%)				
Overall (Positive Agreement)	100.0 (47.8 to 100.0)	100.0 (47.8 to 100.0)	60.0 (14.7 to 94.7)	100.0 (29.2 to 100.0)
Overall (Overall Agreement)	100.0 (47.8 to 100.0)	100.0 (47.8 to 100.0)	60.0 (14.7 to 94.7)	100.0 (29.2 to 100.0)
Nodal (Positive Agreement)	50.0 (6.8 to 93.2)	0.0 (0.0 to 97.5)	100.0 (15.8 to 100.0)	100.0 (29.2 to 100.0)
Nodal (Overall agreement)	50.0 (6.8 to 93.2)	0.0 (0.0 to 84.2)	100.0 (15.8 to 100.0)	100.0 (29.2 to 100.0)
Skeletal (Positive Agreement)	100.0 (39.8 to 100.0)	100.0 (15.8 to 100.0)	999 (999 to 999)	999 (999 to 999)
Skeletal (Overall agreement)	100.0 (39.8 to 100.0)	100.0 (15.8 to 100.0)	999 (999 to 999)	999 (999 to 999)
Skin/Superficial (Positive Agreement)	100.0 (15.8 to 100.0)	999 (999 to 999)	0.0 (0.0 to 97.5)	999 (999 to 999)
Skin/Superficial (Overall agreement)	100.0 (15.8 to 100.0)	999 (999 to 999)	0.0 (0.0 to 97.5)	999 (999 to 999)
Soft Tissue/Visceral (Positive Agreement)	100.0 (39.8 to 100.0)	100.0 (39.8 to 100.0)	40.0 (5.3 to 85.3)	100.0 (29.2 to 100.0)
Soft Tissue/Visceral (Overall agreement)	100.0 (39.8 to 100.0)	100.0 (39.8 to 100.0)	40.0 (5.3 to 85.3)	100.0 (29.2 to 100.0)

End point values	Small-Cell Lung Cancer (SCLC)			
Subject group type	Reporting group			
Number of subjects analysed	1			
Units: Agreement on Diagnostics				
number (confidence interval 95%)				
Overall (Positive Agreement)	100.0 (2.5 to 100.0)			
Overall (Overall Agreement)	100.0 (2.5 to 100.0)			
Nodal (Positive Agreement)	0.0 (0.0 to 97.5)			
Nodal (Overall agreement)	0.0 (0.0 to 97.5)			
Skeletal (Positive Agreement)	999 (999 to 999)			
Skeletal (Overall agreement)	999 (999 to 999)			
Skin/Superficial (Positive Agreement)	999 (999 to 999)			
Skin/Superficial (Overall agreement)	999 (999 to 999)			
Soft Tissue/Visceral (Positive Agreement)	100.0 (2.5 to 100.0)			
Soft Tissue/Visceral (Overall agreement)	100.0 (2.5 to 100.0)			

Statistical analyses

No statistical analyses for this end point

Secondary: Organ-level analyses of Diagnostics by [68Ga]-NeoBOMB1 compared to histological evidence

End point title	Organ-level analyses of Diagnostics by [68Ga]-NeoBOMB1 compared to histological evidence

End point description:

The diagnostic performance of [68Ga]-NeoBOMB1 to GRPR overexpressing malignancies (lesions) was to be compared with cytology and/or histopathology findings from archival and/or recent biopsy specimens. Since the biopsy was performed on 1 lesion (collected either in primary or in metastatic tumors), a direct link may not be possible in case of multiple lesions per organ identified on [68Ga]-NeoBOMB1-PET. In this event, the determination of positive versus negative lesions on [68Ga]-NeoBOMB1-PET was done at organ level, i.e., if any lesion is positive in that organ, then the organ was to be considered positive. The sensitivity and specificity were to be calculated as follows: Sensitivity = 100% x True positive / (True positive + False negative); Specificity = 100% x True negative / (True negative + False positive).

End point type	Secondary

End point timeframe:

Biopsy specimen collected within 6 months prior to study entry up to [68Ga]-NeoBOMB1 PET imaging acquired at Day 1

End point values	Breast	Prostate	Colorectal	Non-Small Cell Lung Cancer (NSCLC)
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	5	5	5	3
Units: Agreement on Diagnostics				
number (confidence interval 95%)	80.0 (28.4 to 99.5)	100.0 (47.8 to 100.0)	20.0 (0.5 to 71.6)	100.0 (29.2 to 100.0)

End point values	Small-Cell Lung Cancer (SCLC)			
Subject group type	Reporting group			
Number of subjects analysed	1			
Units: Agreement on Diagnostics				
number (confidence interval 95%)	0.0 (0.0 to 97.5)			

Statistical analyses

No statistical analyses for this end point

Secondary: Dosimetry Group: absorbed dose in tumor

End point title	Dosimetry Group: absorbed dose in tumor[11]

End point description:

The absorbed dose in tumor and the effective radiation dose were to be summarized with descriptive statistics. Lesion number were assigned by dosimetry expert.

End point type	Secondary

End point timeframe:

[68Ga]-NeoBOMB1 PET imaging acquired at Day 1

Notes:

[11] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Dosimetry analysis only apply to subset of Breast Cancer patients

End point values	Breast			
Subject group type	Reporting group			
Number of subjects analysed	2			
Units: mGy/MBq	999			

Statistical analyses

No statistical analyses for this end point

Secondary: Dosimetry Group: Effective whole-body dose

End point title	Dosimetry Group: Effective whole-body dose[12]

End point description:

The absorbed dose in tumor and the effective radiation dose were to be summarized with descriptive statistics.

End point type	Secondary

End point timeframe:

[68Ga]-NeoBOMB1 PET imaging acquired at Day 1

Notes:

[12] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Dosimetry analysis only apply to subset of Breast Cancer patients

End point values	Breast			
Subject group type	Reporting group			
Number of subjects analysed	2			
Units: µSv/MBq	999			

Statistical analyses

No statistical analyses for this end point

Secondary: Dosimetry Group: half-life of [68Ga]-NeoBOMB1 in blood (T^1/2)

End point title	Dosimetry Group: half-life of [68Ga]-NeoBOMB1 in blood (T^1/2)[13]

End point description:

Venous whole blood samples were collected for activity-based pharmacokinetics characterization in the dosimetry group. PK parameters (Cmax, tmax, AUC(0-t), AUC(0-t)/D, t1/2, AUC(0-inf), CL) were to be listed and summarized using descriptive statistics.

End point type	Secondary

End point timeframe:

[68Ga]-NeoBOMB1 PET imaging acquired at Day 1

Notes:

[13] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Dosimetry analysis only apply to subset of Breast Cancer patients

End point values	Breast			
Subject group type	Reporting group			
Number of subjects analysed	2			
Units: min	999			

Statistical analyses

No statistical analyses for this end point

Secondary: Dosimetry Group: Time of maximum observed drug concentration occurrence (Tmax)

End point title	Dosimetry Group: Time of maximum observed drug concentration occurrence (Tmax)[14]

End point description:

Venous whole blood samples were collected for activity-based pharmacokinetics characterization in the dosimetry group. PK parameters (Cmax, tmax, AUC(0-t), AUC(0-t)/D, t1/2, AUC(0-inf), CL) were to be listed and summarized using descriptive statistics.

End point type	Secondary

End point timeframe:

[68Ga]-NeoBOMB1 PET imaging acquired at Day 1

Notes:

[14] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Dosimetry analysis only apply to subset of Breast Cancer patients

End point values	Breast			
Subject group type	Reporting group			
Number of subjects analysed	2			
Units: min	999			

Statistical analyses

No statistical analyses for this end point

Secondary: Dosimetry Group: Observed maximum plasma concentration (Cmax)

End point title	Dosimetry Group: Observed maximum plasma concentration (Cmax)[15]

End point description:

Venous whole blood samples were collected for activity-based pharmacokinetics characterization in the dosimetry group. PK parameters (Cmax, tmax, AUC(0-t), AUC(0-t)/D, t1/2, AUC(0-inf), CL) were to be listed and summarized using descriptive statistics.

End point type	Secondary

End point timeframe:

[68Ga]-NeoBOMB1 PET imaging acquired at Day 1

Notes:

[15] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Dosimetry analysis only apply to subset of Breast Cancer patients

End point values	Breast			
Subject group type	Reporting group			
Number of subjects analysed	2			
Units: kBq/cc	999			

Statistical analyses

No statistical analyses for this end point

Secondary: Dosimetry Group: Area Under the plasma concentration-time Curve from the time 0 to the last observed quantifiable concentration (AUC(0-t))

End point title	Dosimetry Group: Area Under the plasma concentration-time Curve from the time 0 to the last observed quantifiable concentration (AUC(0-t))[16]

End point description:

Venous whole blood samples were collected for activity-based pharmacokinetics characterization in the dosimetry group. PK parameters (Cmax, tmax, AUC(0-t), AUC(0-t)/D, t1/2, AUC(0-inf), CL) were to be listed and summarized using descriptive statistics.

End point type	Secondary

End point timeframe:

[68Ga]-NeoBOMB1 PET imaging acquired at Day 1

Notes:

[16] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Dosimetry analysis only apply to subset of Breast Cancer patients

End point values	Breast			
Subject group type	Reporting group			
Number of subjects analysed	2			
Units: MBq-s/cc	999			

Statistical analyses

No statistical analyses for this end point

Secondary: Dosimetry Group: AUC(0-t) divided by the dose administered (AUC(0-t)/D)

End point title	Dosimetry Group: AUC(0-t) divided by the dose administered (AUC(0-t)/D)[17]

End point description:

Venous whole blood samples were collected for activity-based pharmacokinetics characterization in the dosimetry group. PK parameters (Cmax, tmax, AUC(0-t), AUC(0-t)/D, t1/2, AUC(0-inf), CL) were to be listed and summarized using descriptive statistics.

End point type	Secondary

End point timeframe:

[68Ga]-NeoBOMB1 PET imaging acquired at Day 1

Notes:

[17] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Dosimetry analysis only apply to subset of Breast Cancer patients

End point values	Breast			
Subject group type	Reporting group			
Number of subjects analysed	2			
Units: s/cc	999			

Statistical analyses

No statistical analyses for this end point

Secondary: Dosimetry Group: Area under the concentration-time curve from time zero (pre-dose) extrapolated to infinite time (AUCinf)

End point title	Dosimetry Group: Area under the concentration-time curve from time zero (pre-dose) extrapolated to infinite time (AUCinf)[18]

End point description:

Venous whole blood samples were collected for activity-based pharmacokinetics characterization in the dosimetry group. PK parameters (Cmax, tmax, AUC(0-t), AUC(0-t)/D, t1/2, AUC(0-inf), CL) were to be listed and summarized using descriptive statistics.

End point type	Secondary

End point timeframe:

[68Ga]-NeoBOMB1 PET imaging acquired at Day 1

Notes:

[18] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Dosimetry analysis only apply to subset of Breast Cancer patients

End point values	Breast			
Subject group type	Reporting group			
Number of subjects analysed	2			
Units: MBq-s/cc	999			

Statistical analyses

No statistical analyses for this end point

Secondary: Dosimetry Group: Total systemic clearance for intravenous administration (CL)

End point title	Dosimetry Group: Total systemic clearance for intravenous administration (CL)[19]

End point description:

Venous whole blood samples were collected for activity-based pharmacokinetics characterization in the dosimetry group. PK parameters (Cmax, tmax, AUC(0-t), AUC(0-t)/D, t1/2, AUC(0-inf), CL) were to be listed and summarized using descriptive statistics.

End point type	Secondary

End point timeframe:

[68Ga]-NeoBOMB1 PET imaging acquired at Day 1

Notes:

[19] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Dosimetry analysis only apply to subset of Breast Cancer patients

End point values	Breast			
Subject group type	Reporting group			
Number of subjects analysed	2			
Units: cc/s	999			

Statistical analyses

No statistical analyses for this end point

Secondary: Dosimetry Group: Urinary excretion of [68Ga]-NeoBOMB1 (Vd)

End point title	Dosimetry Group: Urinary excretion of [68Ga]-NeoBOMB1

End point description:

Urine samples were collected for activity-based pharmacokinetics characterization in the dosimetry group. PK parameters Vd was to be listed and summarized using descriptive statistics.

End point type	Secondary

End point timeframe:

[68Ga]-NeoBOMB1 PET imaging acquired at Day 1

Notes:

[20] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Dosimetry analysis only apply to subset of Breast Cancer patients

End point values	Breast			
Subject group type	Reporting group			
Number of subjects analysed	2			
Units: Liter (L)				
arithmetic mean (standard deviation)	999 (± 999)			

Statistical analyses

No statistical analyses for this end point

Adverse events

Adverse events information

Timeframe for reporting adverse events:

All Adverse Events are collected and reported from First Patient First Visit (FPFV) until Last Patient Last Visit (LPLV).

Adverse event reporting additional description:

Any sign or symptom that occurs after written informed consent provided. For TEAE from first dosing (single administration, Day 1) up to last follow-up visit or until the event has resolved to baseline grade or better or the event was assessed stable by the investigator or the patient was lost to follow-up or withdrew consent.

Assessment type	Systematic

Dictionary used

Dictionary name	MedDRA
Dictionary version	20.1

Reporting groups

Reporting group title	Total

Reporting group description:

Total

Serious adverse events	Total		
Total subjects affected by serious adverse events			
subjects affected / exposed	1 / 19 (5.26%)		
number of deaths (all causes)	0		
number of deaths resulting from adverse events	0		
Blood and lymphatic system disorders			
Leukopenia			
subjects affected / exposed	1 / 19 (5.26%)		
occurrences causally related to treatment / all	0 / 1		
deaths causally related to treatment / all	0 / 0		
Metabolism and nutrition disorders			
Hyponatraemia			
subjects affected / exposed	1 / 19 (5.26%)		
occurrences causally related to treatment / all	0 / 1		
deaths causally related to treatment / all	0 / 0		

Frequency threshold for reporting non-serious adverse events: 5 %

Non-serious adverse events	Total		
Total subjects affected by non-serious adverse events			
subjects affected / exposed	8 / 19 (42.11%)		
Investigations			
Blood cholinesterase decreased			
subjects affected / exposed	1 / 19 (5.26%)		
occurrences (all)	1		
Blood creatine phosphokinase increased			
subjects affected / exposed	1 / 19 (5.26%)		
occurrences (all)	1		
Blood lactate dehydrogenase increased			
subjects affected / exposed	1 / 19 (5.26%)		
occurrences (all)	1		
Blood urea decreased			
subjects affected / exposed	1 / 19 (5.26%)		
occurrences (all)	1		
C-reactive protein increased			
subjects affected / exposed	2 / 19 (10.53%)		
occurrences (all)	2		
Gamma-glutamyltransferase increased			
subjects affected / exposed	2 / 19 (10.53%)		
occurrences (all)	2		
Injury, poisoning and procedural complications			
Post procedural constipation			
subjects affected / exposed	1 / 19 (5.26%)		
occurrences (all)	1		
Procedural pain			
subjects affected / exposed	1 / 19 (5.26%)		
occurrences (all)	1		
Vascular disorders			
Deep vein thrombosis			
subjects affected / exposed	1 / 19 (5.26%)		
occurrences (all)	1		
Hypertension			

subjects affected / exposed occurrences (all)	1 / 19 (5.26%) 1		
Nervous system disorders Paralysis recurrent laryngeal nerve subjects affected / exposed occurrences (all)	 1 / 19 (5.26%) 1		
Blood and lymphatic system disorders Anaemia subjects affected / exposed occurrences (all) Hyperfibrinogenaemia subjects affected / exposed occurrences (all)	 1 / 19 (5.26%) 1 2 / 19 (10.53%) 2		
Psychiatric disorders Insomnia subjects affected / exposed occurrences (all)	 1 / 19 (5.26%) 1		
Renal and urinary disorders Haematuria subjects affected / exposed occurrences (all)	 2 / 19 (10.53%) 2		
Endocrine disorders Hyperparathyroidism subjects affected / exposed occurrences (all)	 2 / 19 (10.53%) 2		
Metabolism and nutrition disorders Hypochloraemia subjects affected / exposed occurrences (all) Hyperalbuminaemia subjects affected / exposed occurrences (all)	 1 / 19 (5.26%) 1 1 / 19 (5.26%) 1		

More information

Substantial protocol amendments (globally)

Were there any global substantial amendments to the protocol? Yes

Date	Amendment
10 November 2017	Amendment 1: Remove reference to a specific commercially available generator for IP reconstitution
14 February 2018	Amendment 2: 1) Update with available information on IP related to safety and dosimetry, 2) Revision of the schedule of assessments, 3) Clarifications on patients assignments in dosimetry or non-dosimetry group, 4) Clarification of the optional status of the routine clinical follow-up, 5) Clarification about allowed concomitant medication, 6) Update on references to ICH E6 and declaration of Helsinki.
05 July 2018	Amendment 3: Deletion of the reference to patients presenting relapsed or refractory metastatic cancer for both dosimetry and non-dosimetry groups to allow inclusion of patients at any stage of the disease.
06 August 2018	Amendment 4 (country specific to France): Reference to patients presenting metastatic cancer, relapsed or refractory, added for dosimetry group

Notes:

Interruptions (globally)

Were there any global interruptions to the trial? No

Limitations and caveats

Limitations of the trial such as small numbers of subjects analysed or technical problems leading to unreliable data.

Recruitment was stopped before the target sample size was achieved..

Notes: