

# Expanding the Treatment Landscape for Recurrent Low-Grade Serous Ovarian Cancer

An Industry Supported Symposium at the IGCS 2024 Annual Global Meeting

**Friday, October 18, 2024**

Dublin, Ireland



# Welcome and Introductions

All Faculty



# Faculty

**Pedro T. Ramirez, MD, FACOG**

Houston Methodist Hospital  
Houston, Texas, USA



**Susana Banerjee, MBBS, MA, PhD, FRCP**

The Royal Marsden and the Institute of Cancer Research  
United Kingdom



**Rachel N. Grisham, MD**

Memorial Sloan Kettering Cancer Center  
New York, New York, USA

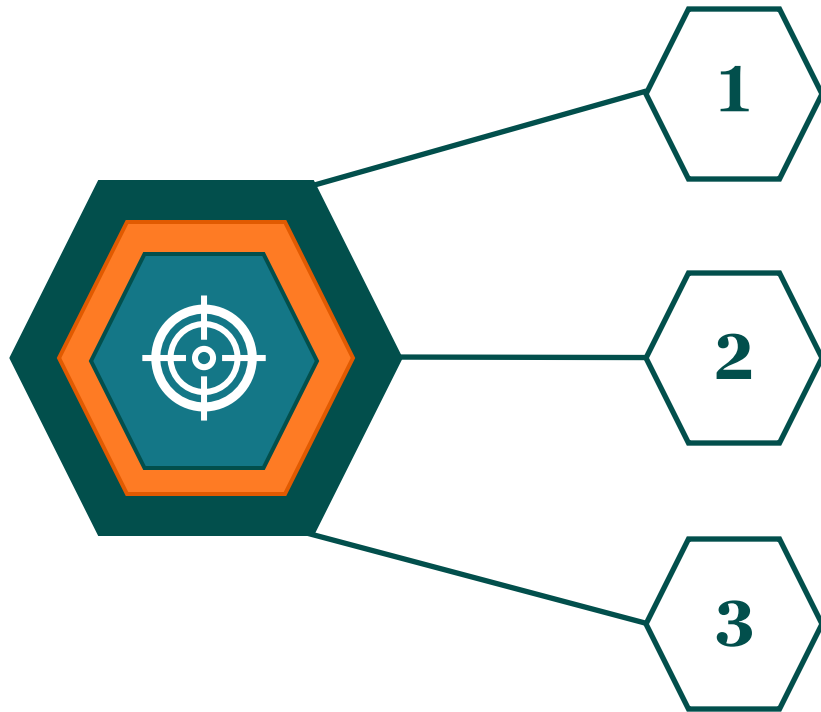


# Faculty Disclosures

Name	Role in Activity	Disclosures
Pedro T. Ramirez, MD, FACOG	Moderator	Nothing to Disclose
Susana Banerjee, MBBS, MA, PhD, FRCP	Speaker	<b>Consulting/ Advisory Board:</b> AbbVie, AstraZeneca, BioNTech, Eisai, Gilead, GlaxoSmithKline, Immunogen, Incyte, ITM Oncologics, Merck Sharpe Dohme, Mersana, Myriad, Oncxerna, Pharma&, Seagen, Verastem, Zymeworks  <b>Honoraria/Expenses:</b> AbbVie, AstraZeneca, GlaxoSmithKline, Immunogen, Merck Sharpe Dohme, Mersana, Takeda, Verastem  <b>Funded Research:</b> Institution AstraZeneca, GlaxoSmithKline, Verastem (PI)
Rachel N. Grisham, MD	Speaker	<b>Consulting/ Advisory Board:</b> AstraZeneca, GlaxoSmithKline, Incyte, GenMab, Verastem, SpringWorks, Myriad  <b>Funded Research to Institution:</b> Context, Pfizer, Bayer, Verastem

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# Learning Objectives



1 Highlight Clinical Landscape and Learn About Challenges as it Pertains to Recurrent LGSOC

2 Understand Most Recent Clinical Trial Data and Treatment Options in Recurrent LGSOC

3 Share Best Practices and Discuss Future Directions in Treatment Landscape

# Agenda

**7:45 – 7:50:**    **Welcome and Introductions**

Pedro T. Ramirez, MD, FACOG, Houston Methodist Hospital; Houston, Texas, USA

**7:50 – 8:10:**    **Current Landscape in LGSOC**

Rachel N. Grisham, MD; Memorial Sloan Kettering Cancer Center; West Harrison, New York, USA

**8:10 – 8:30:**    **Latest Data and Future Directions**

Susana Banerjee, MBBS, MA, PhD, FRCP, The Royal Marsden and the Institute of Cancer Research, United Kingdom

**8:30 – 8:40:**    **Question and Answers**

All Faculty

**8:40 – 8:45:**    **Closing Comments**

Pedro T. Ramirez, MD, FACOG, Houston Methodist Hospital; Houston, Texas, USA



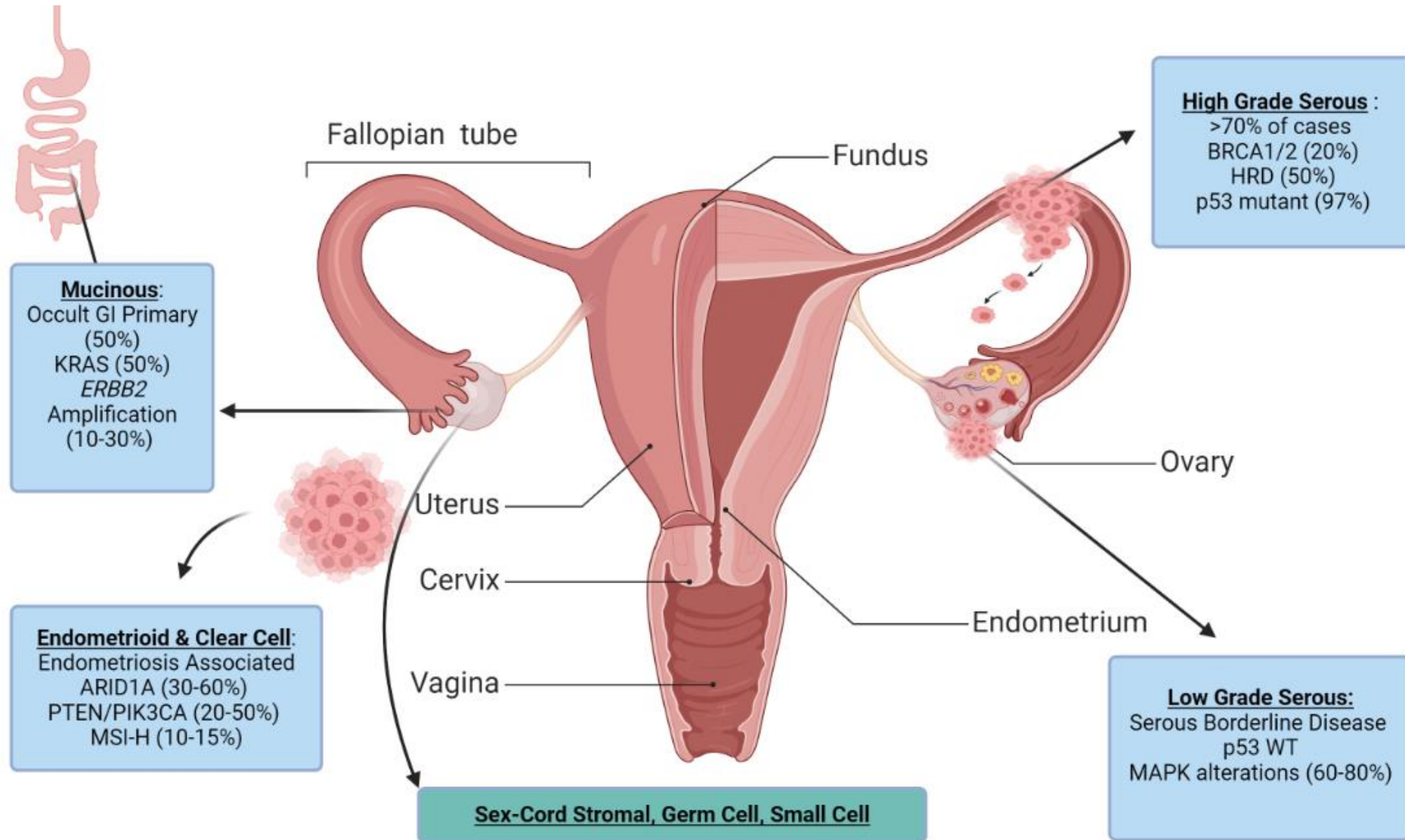
# Current Landscape in LGSOC

**Rachel N. Grisham, MD**

Memorial Sloan Kettering Cancer Center  
New York, New York, USA



# Ovarian, Primary Peritoneal and Fallopian Tube Cancer





# Molecular and Clinical Features of LGSOC and HGSOC

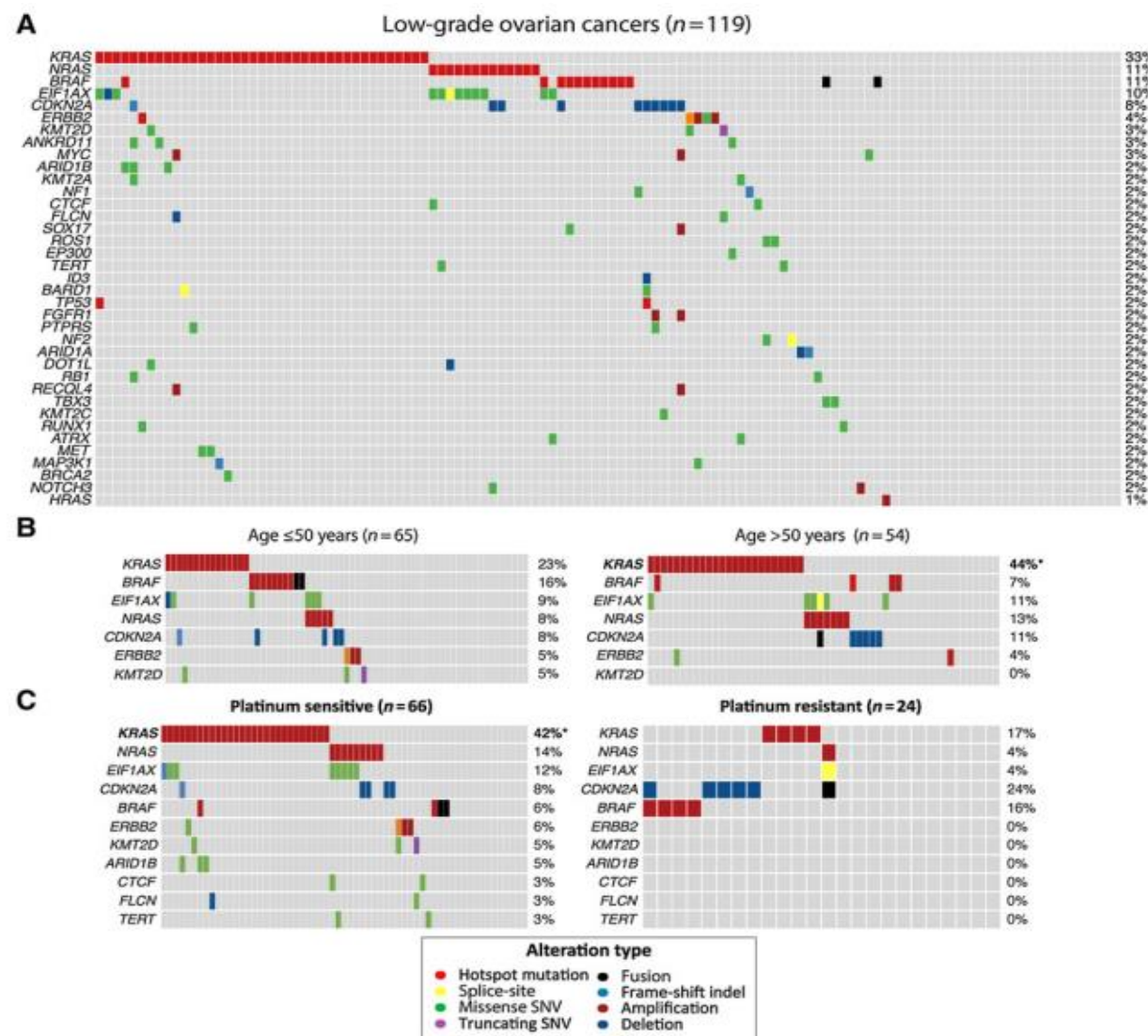
LGSOC accounts for <10% of new epithelial ovarian cancers

LGSOC	HGSOC	
Clinical/Molecular Features	LGSOC	HGSOC
Median age at diagnosis <sup>2,3</sup>	40-50 years	50-60 years
Molecular genetics <sup>4-6</sup>	Mutant: <i>BRAF</i> , <i>RAS</i> Wild type: <i>p53</i>	Mutant: <i>p53</i> , <i>BRCA</i> , <i>HRD</i> Wild type: <i>BRAF</i> , <i>RAS</i>
GOG158 (stage III, optimal) upfront chemotherapy; BICR (paclitaxel + carboplatin) <sup>3</sup>	n=21 PFS: 45.0 months OS: 126.2 months	n=220 PFS: 19.8 months OS: 53.8 months
Response rate to neoadjuvant chemotherapy <sup>7-9</sup>	4%-23%	80%-90%
Response to chemotherapy in the recurrent setting (weekly paclitaxel, topotecan, or PLD) <sup>10-13</sup>	0%-15%	0%-30%
Rate of hormone receptor positivity <sup>14-16</sup>	ER: 58%-96% PR: 32%-76%	ER: 81%-86% PR: 31%-55%

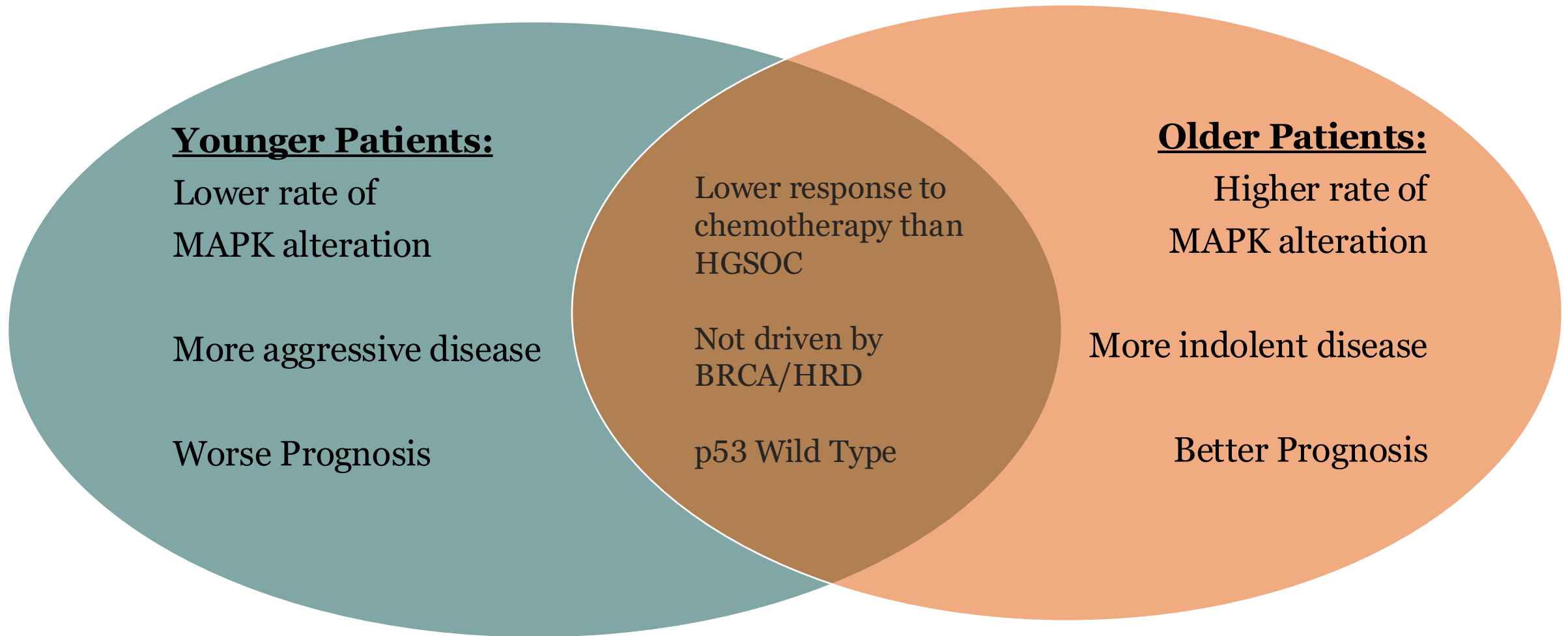
BICR, blinded independent central review; BRAF, B-Raf proto-oncogene; BRCA, breast cancer gene; ER, estrogen receptor; HGSOC, high-grade serous ovarian cancer; HRD, homologous recombination deficiency; LGSOC, low-grade serous ovarian cancer; OS, overall survival; p53, tumor protein p53 gene; PFS, progression-free survival; PLD, pegylated liposomal doxorubicin; PR, progesterone receptor; RAS, rat sarcoma gene.

1. Grisham RN, et al. *Int J Gyn Can.* 2023;33(9):1331-1344; 2. Grisham RN. *Oncology.* 2016;30(7):650-652; 3. Bodurka DC, et al. *Cancer.* 2012;118(12):3087-3094; 4. Bookman MA, et al. *J Natl Cancer Inst.* 2014;106(4):1-8; 5. Mullany LK, et al. *Endocrinology.* 2012;153(4):1638-1648; 6. Vang R, et al. *Adv Anat Path.* 2009;16(5):267-282; 7. du Bois A, et al. *J Clin Oncol.* 2019;37(27):2398-2405; 8. Schmeler KM, et al. *Gynecol Oncol.* 2008;108(3):510-514; 9. Grabowski JP, et al. *Gynecol Oncol.* 2016;140(3):457-462; 10. Poveda AM, et al. *J Clin Oncol.* 2015;33(32):3836-3838; 11. Monk BJ, et al. *J Clin Oncol.* 2020;38(32):3753-3762; 12. Gershenson DM, et al. *Gynecol Oncol.* 2009;114(1):48-52; 13. Pujade-Lauraine E, et al. *J Clin Oncol.* 2014;32(13):1302-1308; 14. Chen S, et al. *Sci Rep.* 2017;7(1):16922; 15. Sieh et al. *Lancet Oncol.* 2013;14(9):853-862; 16. Gadducci A, Cosio S. *Cancers.* 2020;12(5):1336.

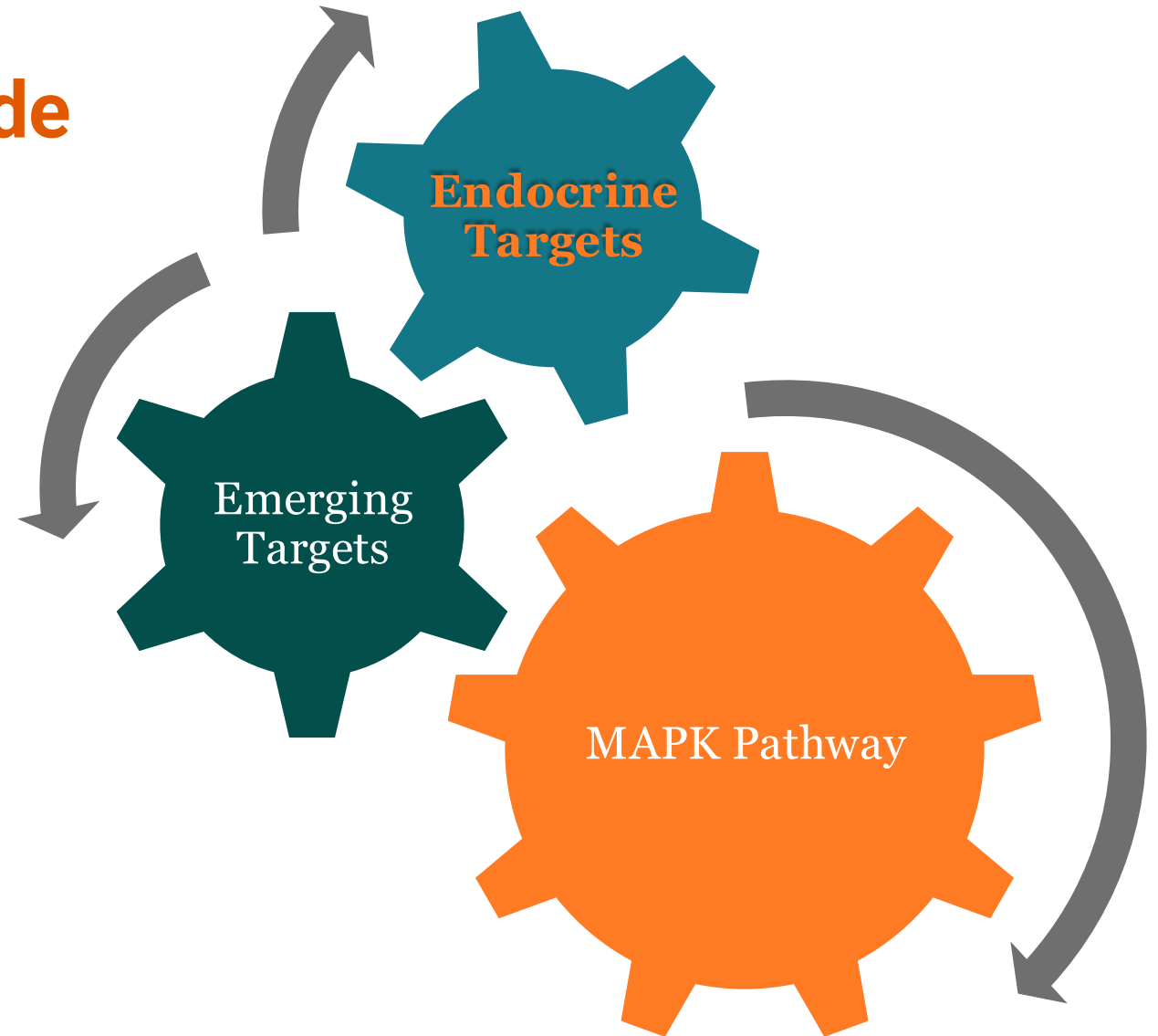
# MAPK Alterations Both Prognostic and a Treatment Target



# Clinical Characteristics of Low Grade Serous Ovarian Cancer



# Beyond Chemotherapy: Targeting Recurrent Low Grade Serous Ovarian Cancer



## Single Agent Aromatase Inhibitors and SERMs

- Anastrozole
- Letrozole
- Tamoxifen

## Alternative Endocrine Therapies

- Enzalutamide
- Onapristone

## Combination Strategies

- Ribociclib with  
Letrozole



# Single Agent Aromatase Inhibitors and SERMs

- Anastrozole
- Letrozole
- Tamoxifen

# PARAGON:

## Phase II Study of Anastrozole in Low Grade Ovarian Tumors

- Patients with ER and or PR + tumor > 10% by IHC
- Measurable disease by RECIST 1.1 or GCIG CA125 criteria
- Patients treated with anastrozole 1mg daily until POD

### Results:

- 23/36 (64%) of patients had clinical benefit at 3 months
- **12 month CBR of 34%** (95% CI , 19-50%)
- **Response rate of 14%**
- **Median PFS of 11.1 months** (95% CI, 3.2-11.9)

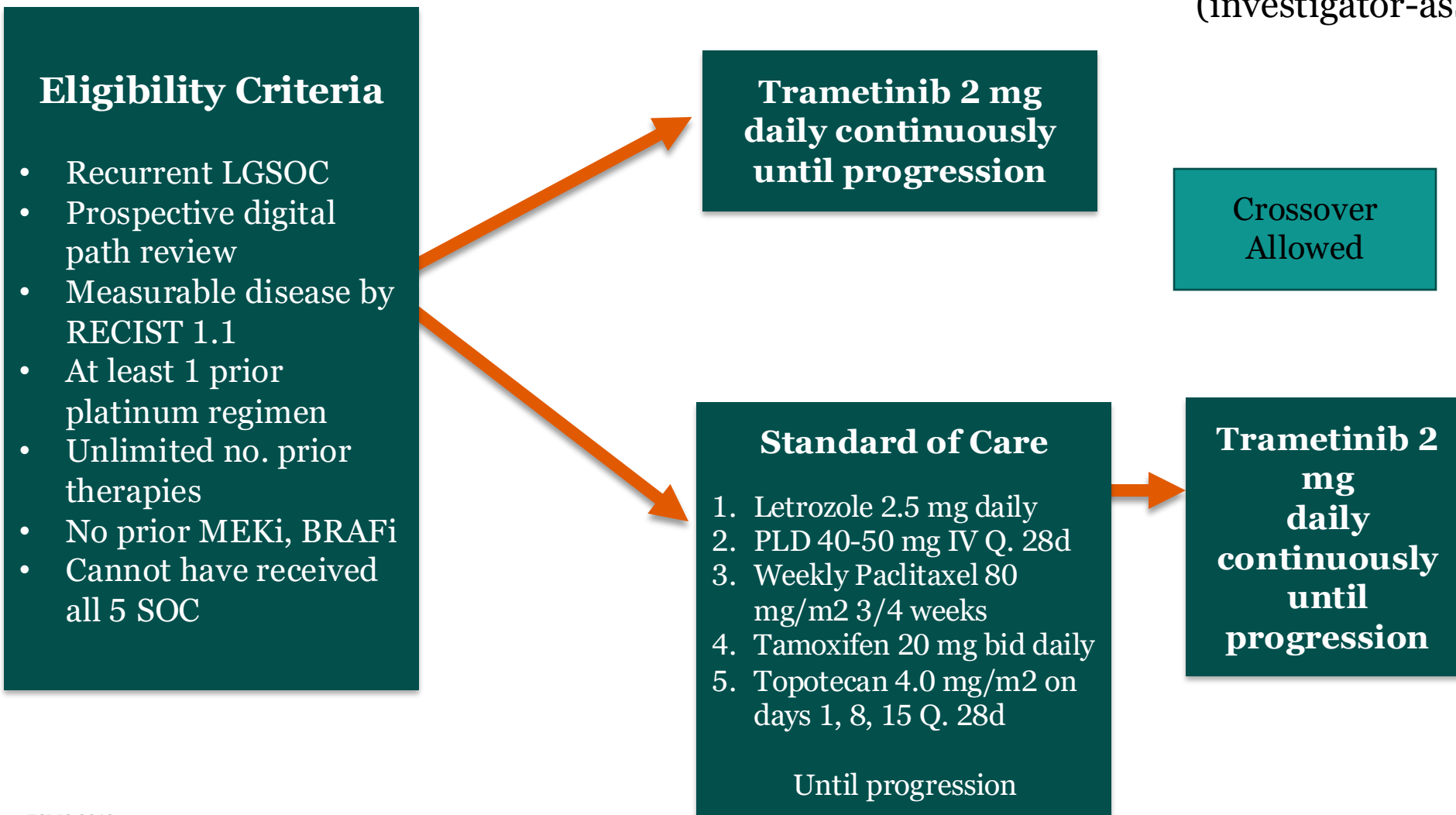
Patient characteristics at baseline (n = 36).	
Characteristic	n (%)
Age [years, mean (range)]	57 (22–77) <sup>a</sup>
ECOG performance status	
0	23 (64)
1	13 (36)
Hormone receptor status	
ER+/PR-	16 (44)
ER+/PR+	20 (56)
Histology	
Low-grade serous carcinoma	34 (94) <sup>b,c,d</sup>
Low-grade endometrioid carcinoma	2 (6)
Lines of prior chemotherapy	
0	1 (3)
1	22 (61)
≥2	13 (36)
Prior chemotherapy	35 (97)
Prior radiotherapy	3 (8)
Treatment-free interval	
<6 months	11 (31)
6–12 months	8 (22)
>12 months	16 (44)
No prior chemotherapy	1 (3)
Method of response measurement	
RECIST V1.1	32 (89)
CA125 by GCIG criteria	4 (11)

ER, estrogen receptor; PR, progesterone receptor; GCIG, Gynecologic Cancer InterGroup;

# NRG-GOG 0281 Study Design

N=260

Primary Endpoint: PFS  
(investigator-assessed)



# NRG-GOG 0281 Control Arm Outcomes

Treatment	# of Patients with CR or PR	Objective Response Rate	Response Duration in Months (95% CI)
Control	8/130	6.2% (2-10)	5.9 (2.8-12.2)
Letrozole	6/44	13.6%	
Tamoxifen	0/27	0%	
Paclitaxel	1/11	9.1%	
Liposomal Doxorubicin	1/40	2.5%	
Topotecan	0/8	0%	

## Single Agent Aromatase Inhibitors and SERMs

- Anastrozole
- Letrozole
- Tamoxifen

## Alternative Endocrine Therapies

- Enzalutamide
- Onapristone



# Phase II Study of Enzalutamide in AR+ Recurrent Ovarian Cancer

- Enzalutamide is a small molecule androgen-receptor antagonist that blocks testosterone binding to the androgen receptor, impedes nuclear translocation of the androgen receptor, and inhibits binding of DNA
- Enzalutamide is FDA approved for multiple indications in prostate cancer
- Enzalutamide has demonstrated clinical activity and was well tolerated in AR+ TNBC patients (CBR 25% at 16 weeks and PFS 2.9 months in ITT population)
- Androgen receptor positivity has been shown to decrease following chemotherapy, indicating that patients with multiple prior lines of chemo may be less responsive to antiandrogen therapy
- Androgen receptors are found in 67% of epithelial ovarian cancer cases

# Phase II Study of Enzalutamide in AR+ Recurrent Ovarian Cancer

- **Single Institution, all patients enrolled at Memorial Sloan Kettering Cancer Center (MSKCC), USA**
- **Advanced or Recurrent Ovarian, Primary Peritoneal or Fallopian Tube Cancer**
- **1-3 Prior Lines of Chemotherapy**
- **Measurable Disease**

- **Screening of Archival Tumor Tissue in MSKCC CLIA Approved Lab for AR by IHC (Ventana)**

**AR < 5%  
Ineligible for Study Screening**

**AR ≥ 5%  
Eligible for Study Screening**

**Enzalutamide 160 mg PO QD  
until POD or Unacceptable  
Toxicity**

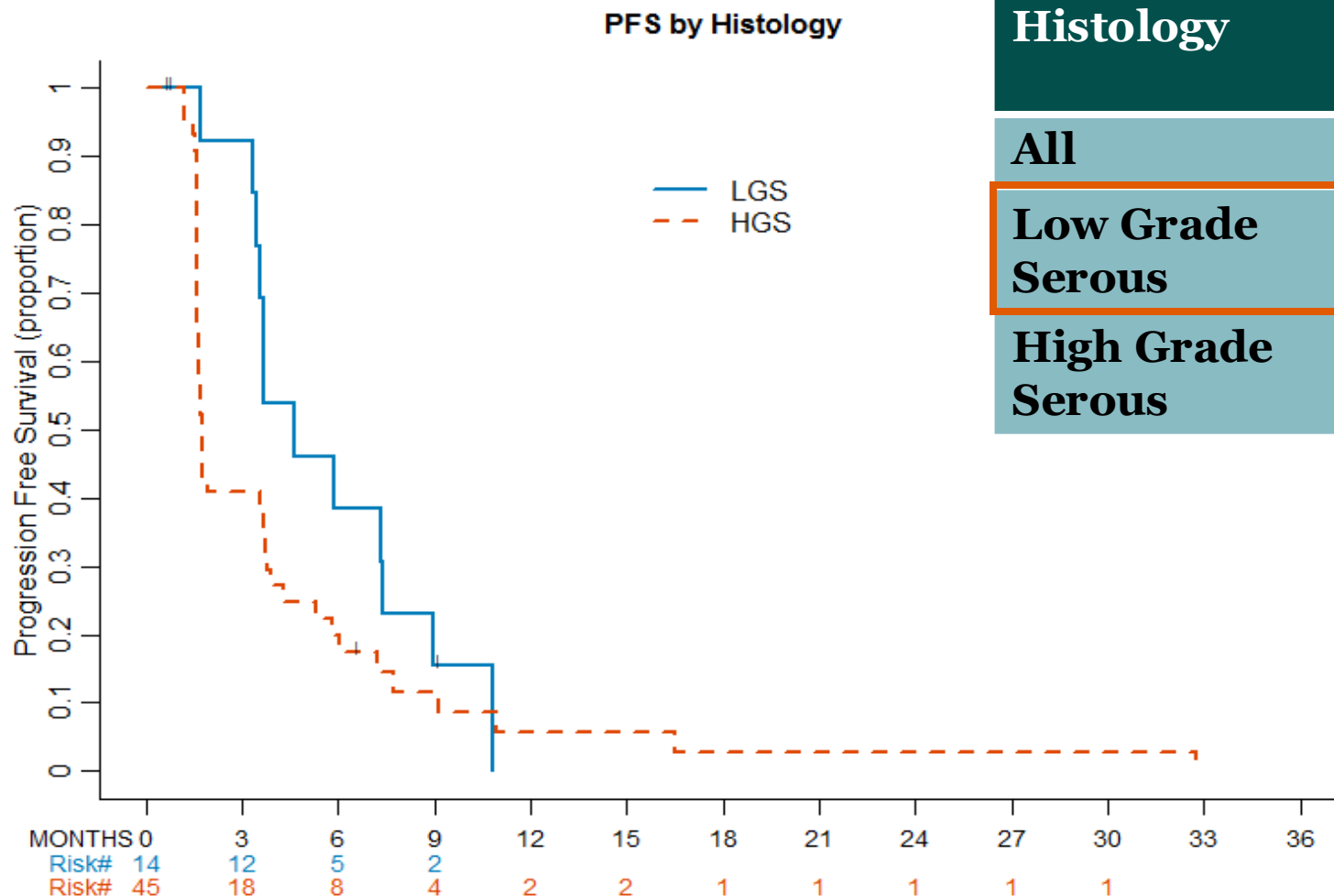
Primary Objective: estimate the proportion of women who survive progression free for ≥ 6 months or have objective tumor response by RECIST 1.1

# Baseline Characteristics

Age	Median	64
	Mean	68
	Range	29-87
BMI	Median	26
	Mean	29
	Range	19.8-56.4
# Lines of Prior Chemotherapy	1 Line	11 (19%)
	2 Lines	32 (54%)
	3 Lines	16 (27%)

Debulking Surgery	Optimal	53 (90%)
	Suboptimal	5 ( 8%)
	Unknown	1 (2%)
Prior Hormonal therapy		13 (22%)
Prior Radiation Therapy		1 (2%)
Race		
	White	48 (81%)
	African American	2 (3%)
	Asian, Indian, Pakistani	5 (9%)
	Unknown	4 (7%)
Histology	High Grade Serous	45 (76%)
	Low Grade Serous	14 (24%)

# Progression Free Survival By Histology



Histology	Median PFS	6 month PFS (90% CI)
All	3.5 months	24% (17-100%)
Low Grade Serous	4.6 months	39 % (22-100%)
High Grade Serous	1.7 months	20 % (13%-100%)

- There was 1 confirmed (HGSOC) and 1 unconfirmed (LGSOC) partial response by RECIST 1.1  
2% (1/59) confirmed response rate
- Thirteen patients remained progression free for  $\geq 6$  months
  - 22% PFS<sub>6</sub> (13/59)
  - 8 with HGSOC
  - 5 with LGSOC

# Basket Study of Oral Progesterone Antagonist Onapristone Extended Release in PR+ Granulosa Cell, LGSOC or Endometrioid Endometrial Cancer

- Onapristone extended release (ONA-XR) (Context Therapeutics) is a type I full progesterone antagonist that inhibits progesterone mediated PR activation and stabilizes PR association with corepressors
- ONA-XR has shown activity across multiple preclinical models of hormonally driven cancer
- Two phase I-II studies of breast cancer patients onapristone exhibited a 56% ORR and a 67% CBR in patients with locally advanced hormone therapy naïve MBC [1] and a 10% ORR and 49% CBR in metastatic tamoxifen-resistant patients [2]
- The progesterone receptor is commonly expressed in GCT (98% of cases), LGSOC (58% of cases), and EEC (67% of cases)



# Basket Study of Oral Progesterone Antagonist Onapristone Extended Release in PR+ Granulosa Cell, LGSOC or Endometrioid Endometrial Cancer

Table 1: Key Inclusion & Exclusion Criteria

INCLUSION CRITERIA	EXCLUSION CRITERIA
Histologically confirmed at MSKCC GCT, LGSOC, or EEC with PR expression $\geq 1\%$ by IHC from tissue collected within the past 3 years	Endocrine/hormonal therapy for treatment of cancer within 28 days of starting study drug
Measurable disease by RECIST 1.1	Requirement for chronic corticosteroid therapy
$\geq 1$ prior line of chemotherapy, unlimited additional lines of therapy are allowed	Another invasive malignancy with evidence of disease within past 3 years
Ability to swallow and absorb tablets	Known brain metastasis without stability for $\geq 6$ months

# Basket Study of Oral Progesterone Antagonist Onapristone Extended Release in PR+ Granulosa Cell, LGSOC or Endometrioid Endometrial Cancer

Cancer Type	Evaluable Patients	Median PFS, months (2-sided 95% CI)	3 month PFS rate (2-sided 95% CI)	6 month PFS rate (2-sided 95% CI)
Granulosa Cell	14	2.8 (1.6-4.9)	50% (22.9-72.2%)	21.4% (5.2%-44.8%)
LGSOC	4	4.4 (1.8-NE)	75% (12.8%-96.1%)	NR
Endometrial Cancer	1	Progressed at 1.6 months	NR	NR

## Single Agent Aromatase Inhibitors and SERMs

- Anastrozole
- Letrozole
- Tamoxifen

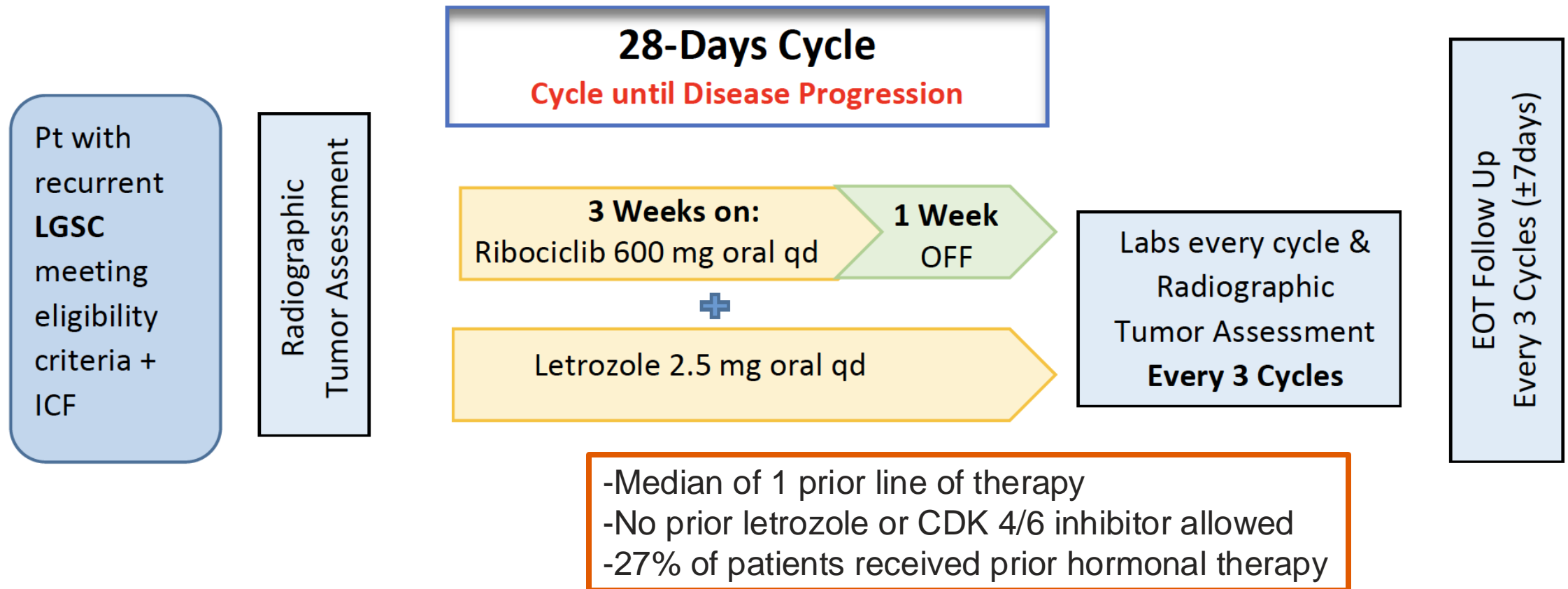
## Alternative Endocrine Therapies

- Enzalutamide
- Onapristone

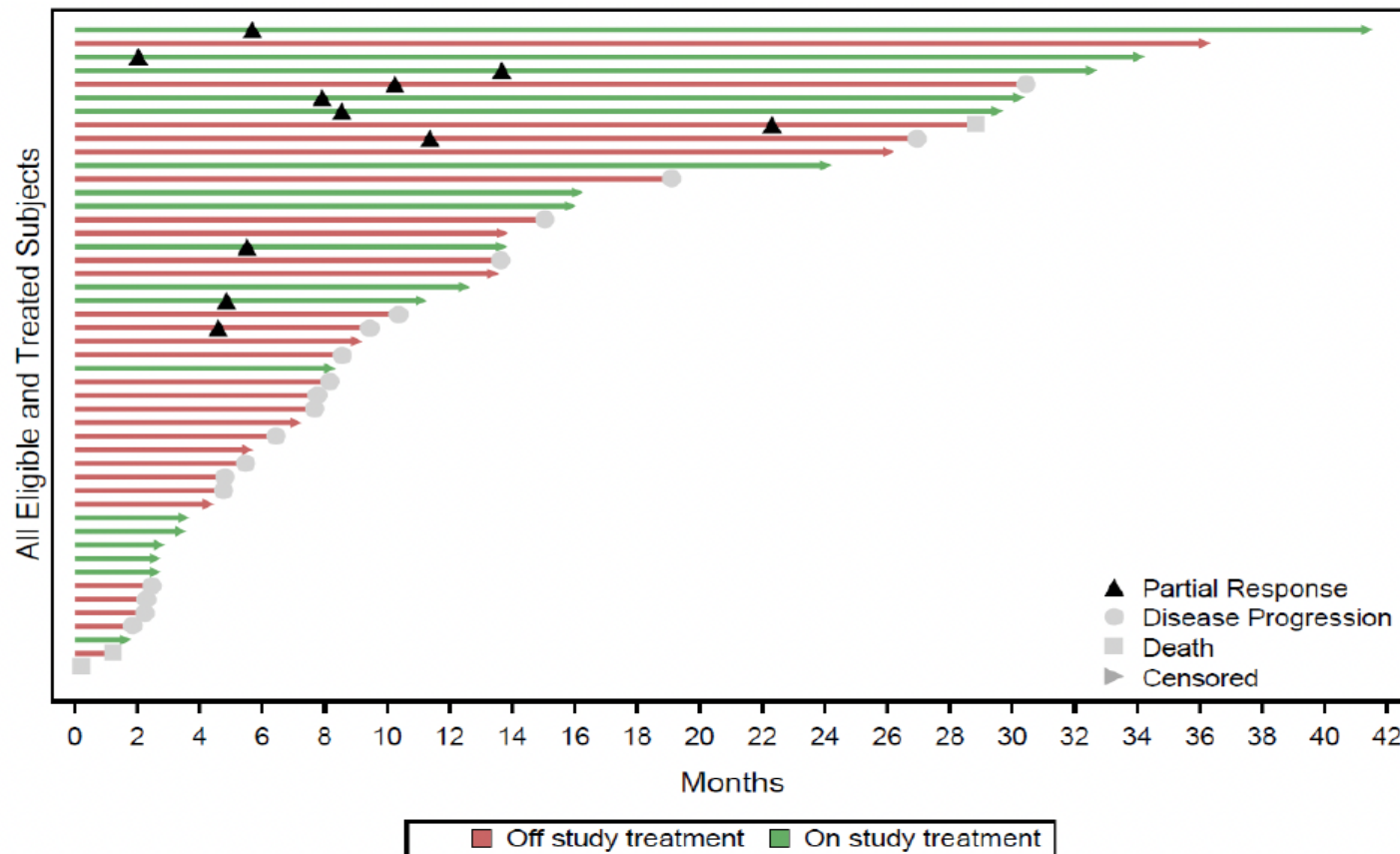
## Combination Strategies

- Ribociclib with  
Letrozole

# GOG 3026: A Phase II Trial of Letrozole + Ribociclib in Women with Recurrent LGSOC



# GOG 3026 A Phase II Trial of Letrozole + Ribociclib in Women with Recurrent LGSOC



Each bar represents one subject in the study.

†: Data for this trial are still accumulating. Patient dispositions and outcomes will change as the data mature.

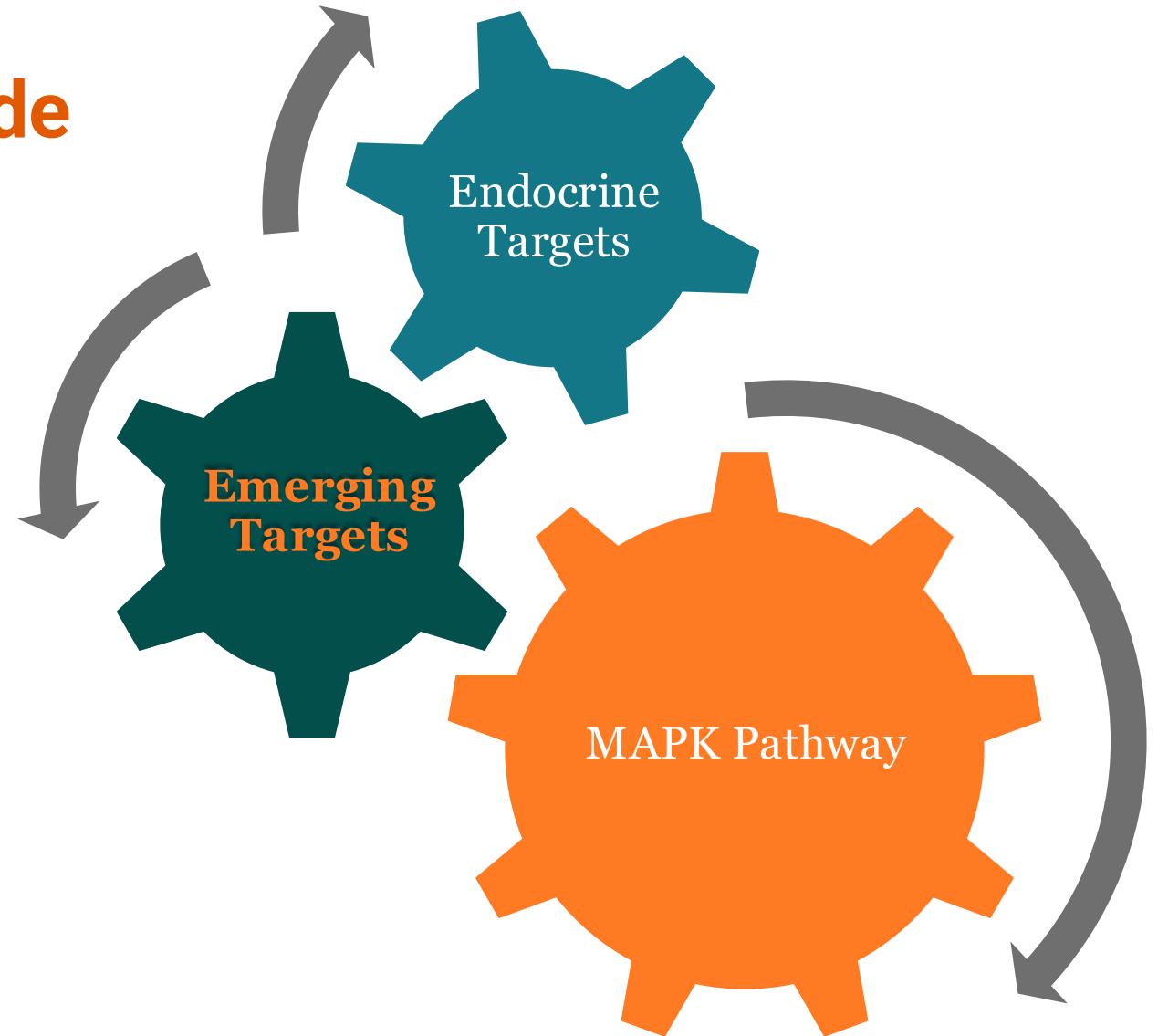
ORR: **23%** (n=11, all PR)

Responders:

DOR (median): **19.1  
mos** (4.8 -35.8)



# Beyond Chemotherapy: Targeting Recurrent Low Grade Serous Ovarian Cancer



# Folate Receptor Alpha in LGSOC



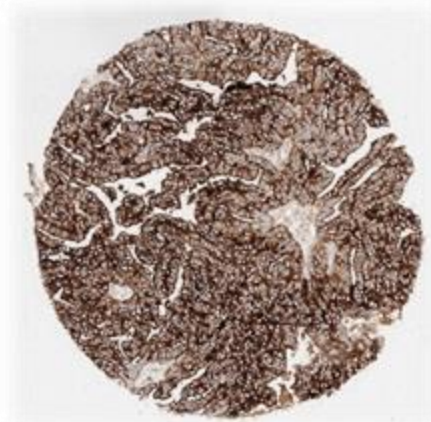
Tissue microarray  
constructed (archival  
LGSOC and SBT tissue)

Immunohistochemistry  
& FRa scoring

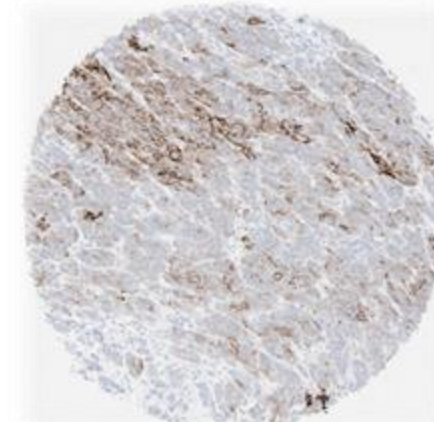
Massively parallel  
sequencing of LGSOC

Associations between FRa  
& clinical variables/MAPK  
alterations

**FRa positive ( $\geq 75\%$   
membrane staining)**



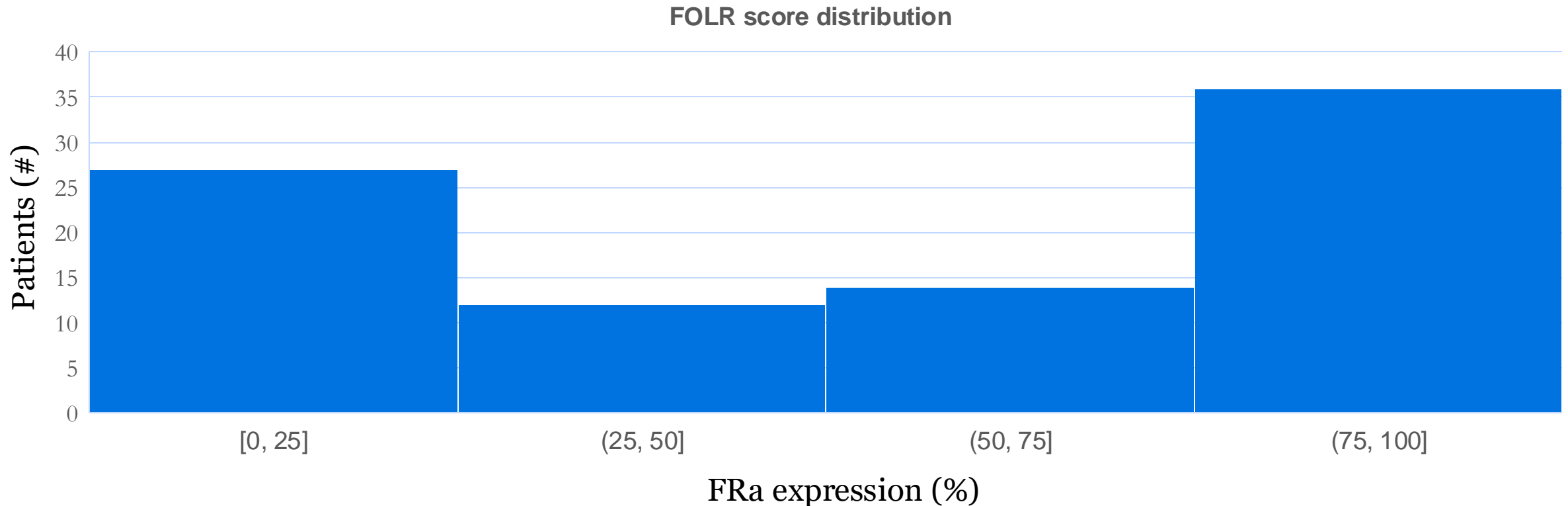
**FRa negative ( $< 75\%$   
membrane staining)**





# Results: prevalence of FRa positivity

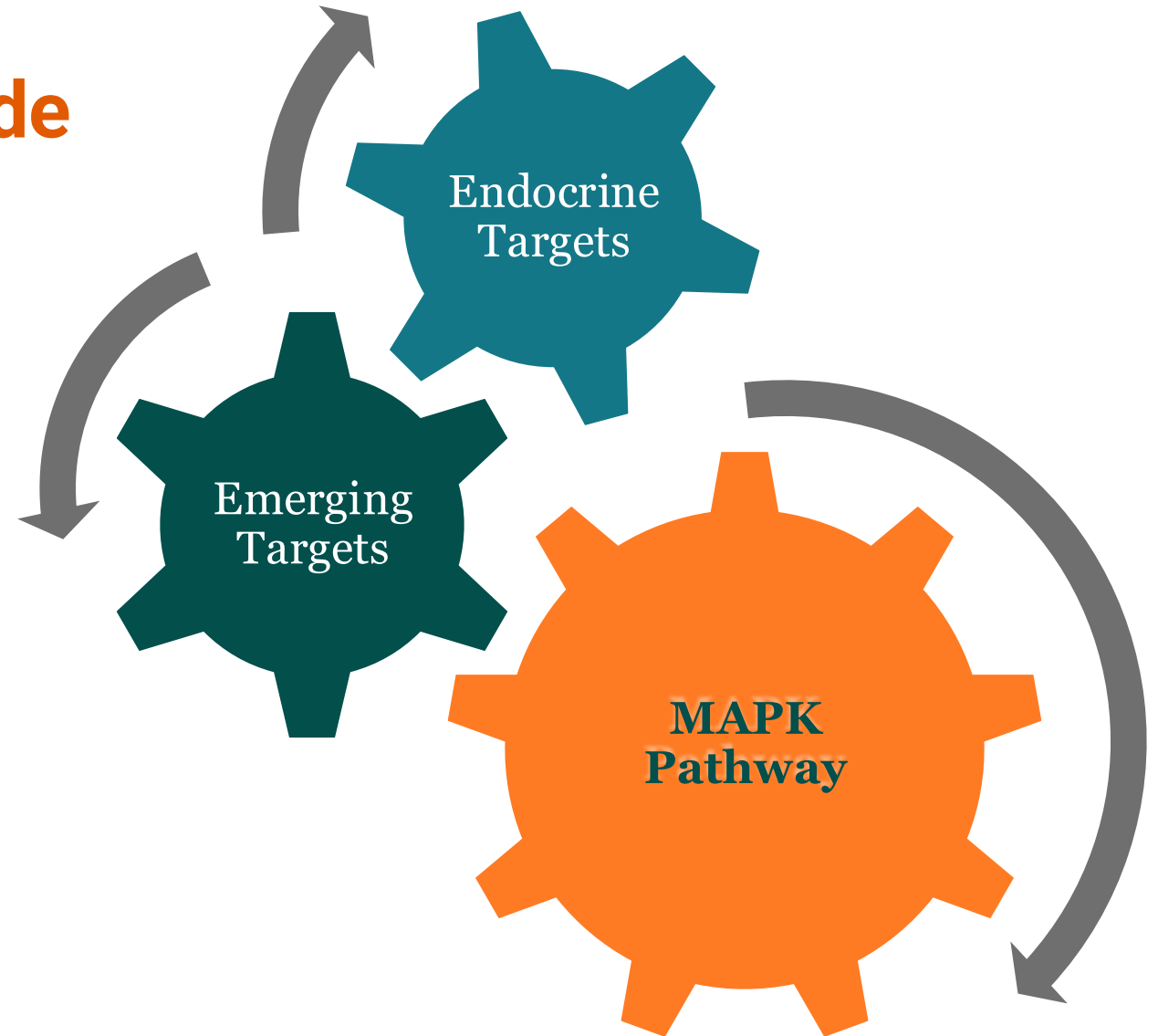
- Of **89** low grade serous ovarian cancer samples
  - FRa positive: 36 (40.4%) (median FR+ expression 85.5%, range 77.5-100.0%)
  - FRa negative: 53 (60.6%) (median FR+ cells 24.1% , range 0.0-72.9%)



# FOLR1+ Inversely Associated with MAPK Alteration

- Overall, 45 of 78 sequenced tumors (58%) had MAPK alteration.
- Negative association between FRa positivity and MAPK pathway alteration ( $p < 0.001$ ):
  - **20%** (9 of 45) of LGSOC **with MAPK** alteration were **FRa positive**.
  - **61%** (20 of 33) of LGSOC **without MAPK** alteration were **FRa positive**

# Beyond Chemotherapy: Targeting Recurrent Low Grade Serous Ovarian Cancer



# GOG 239 – Selumetinib (AZD6244) For Low Grade Serous Ovarian Cancer

## Eligibility:

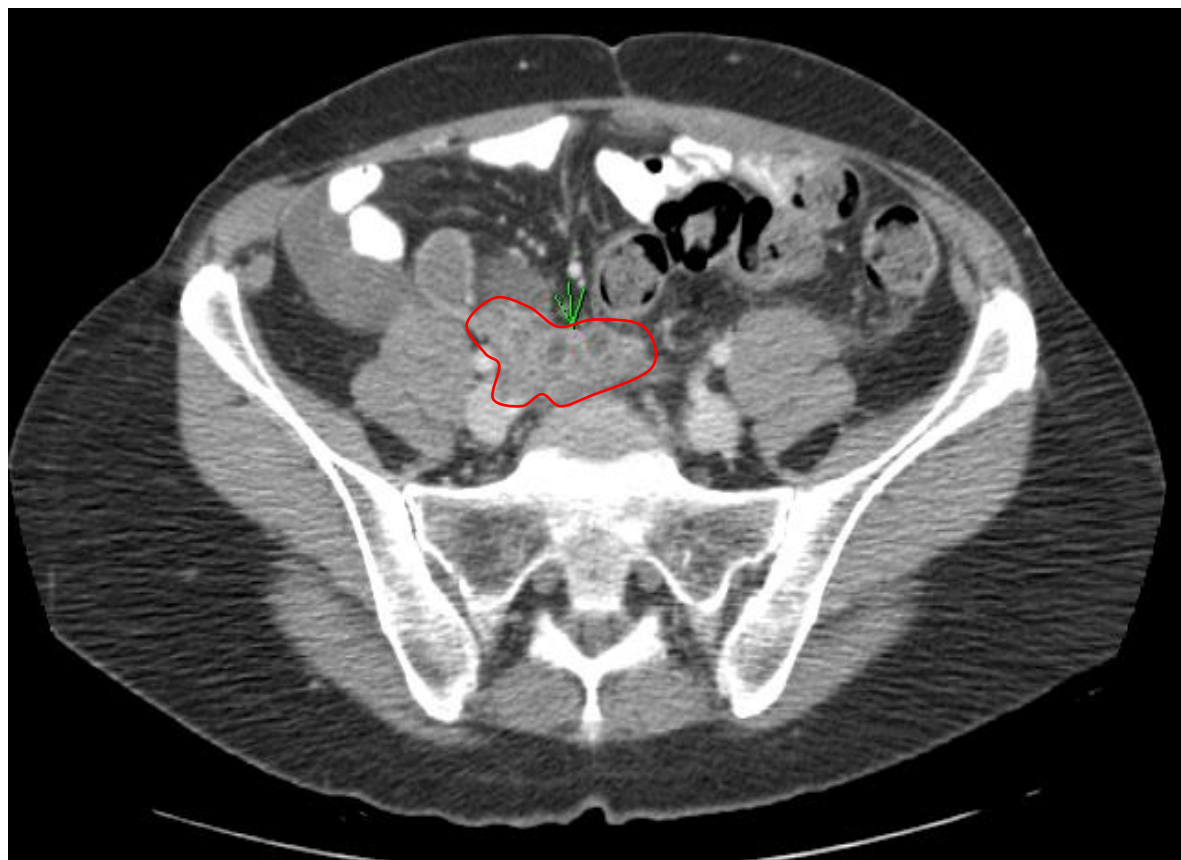
- Prospective Central Pathology
- Recurrent Disease
- Measurable Disease
- No Restrictions on Prior Therapy



Selumetinib 50 mg oral  
BID

- Objective Response Rate = 15% (8/52 patients)
- 1 Complete Response and 7 Partial Responses
- 35 Patients had archival FFPE tissue available for direct sequencing of KRAS and BRAF, no association found between mutation and response to treatment

# GOG 239 Complete Responder; WT BRAF/KRAS



9/2009



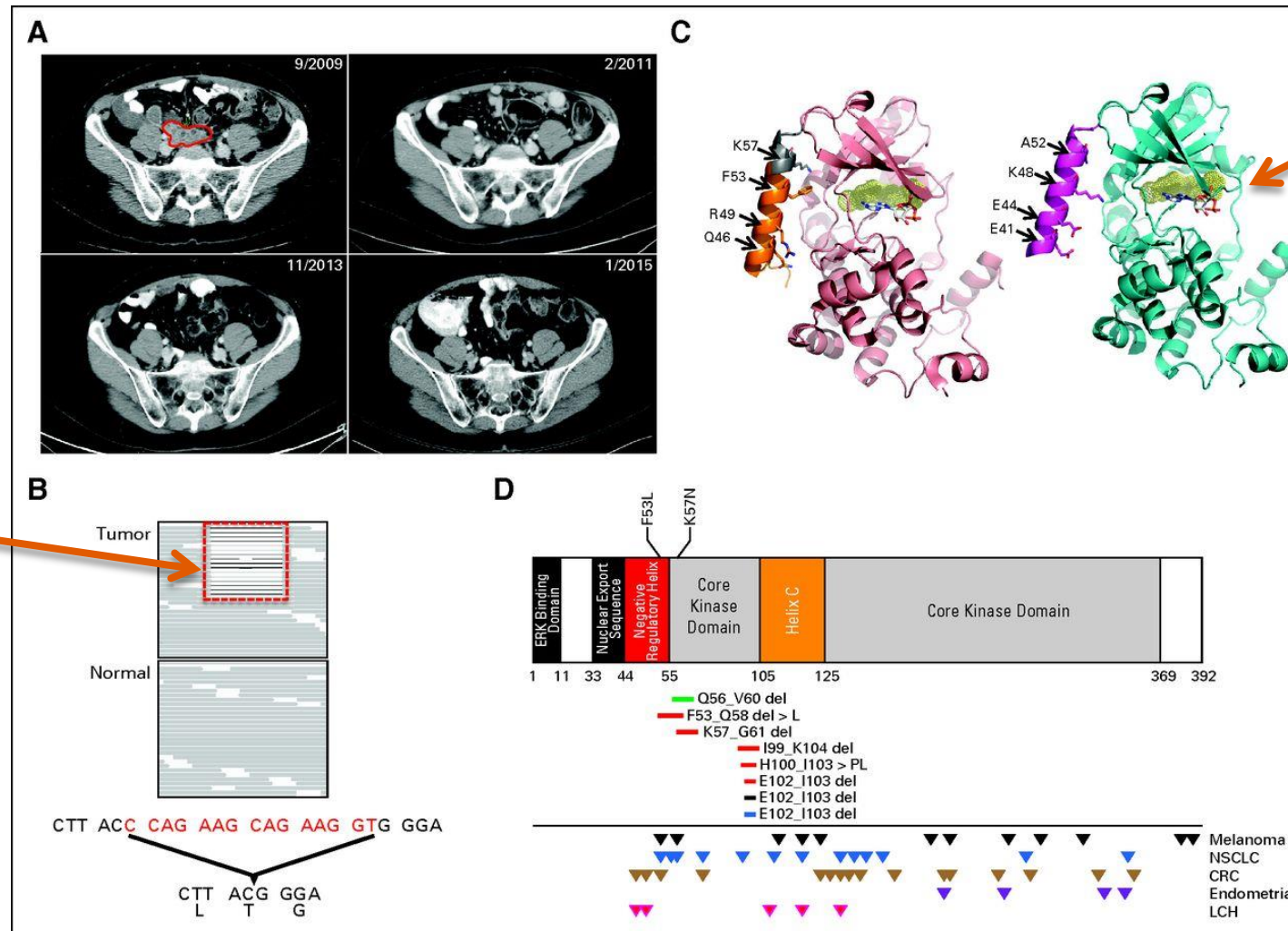
2/2011



# Analysis of Extraordinary Responder to Selumetinib Identified 15-Base Pair Deletion in MAP2K1 gene

*MAP2K1*  
(MEK1)  
Deletion

In frame  
deletion of 5  
amino acids  
(Q56\_V60del)

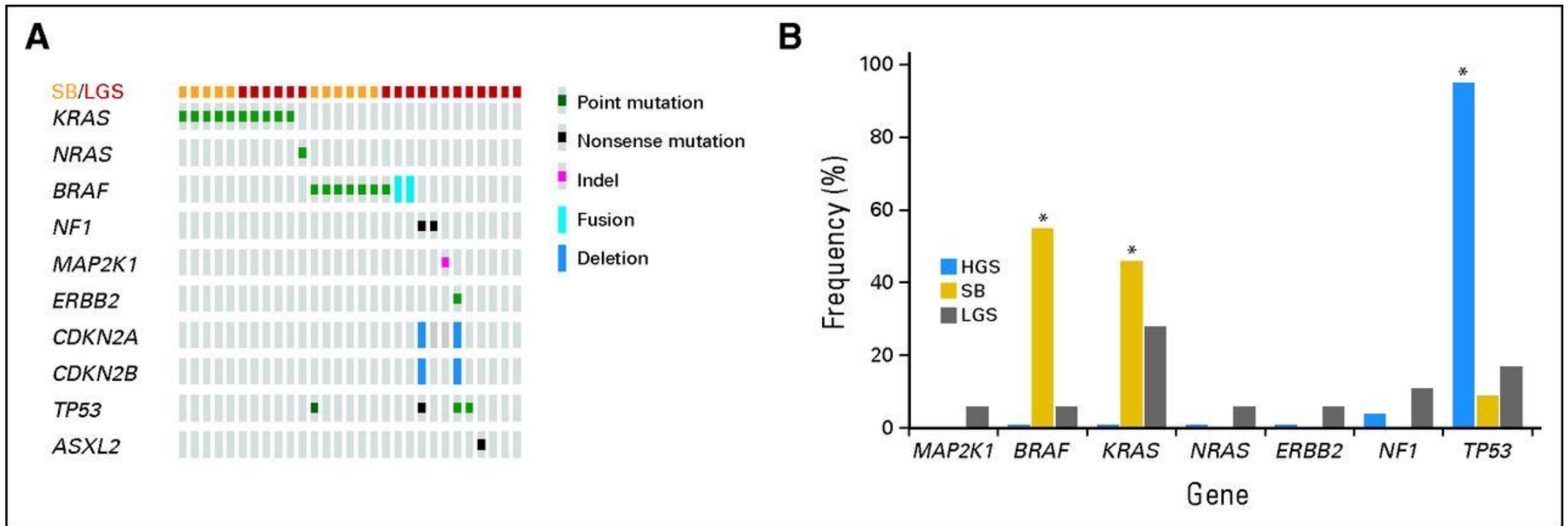


Structural modeling  
predicts disruption  
of interaction  
between negative  
regulatory helix and  
core kinase domain  
-> Constitutive  
kinase activation

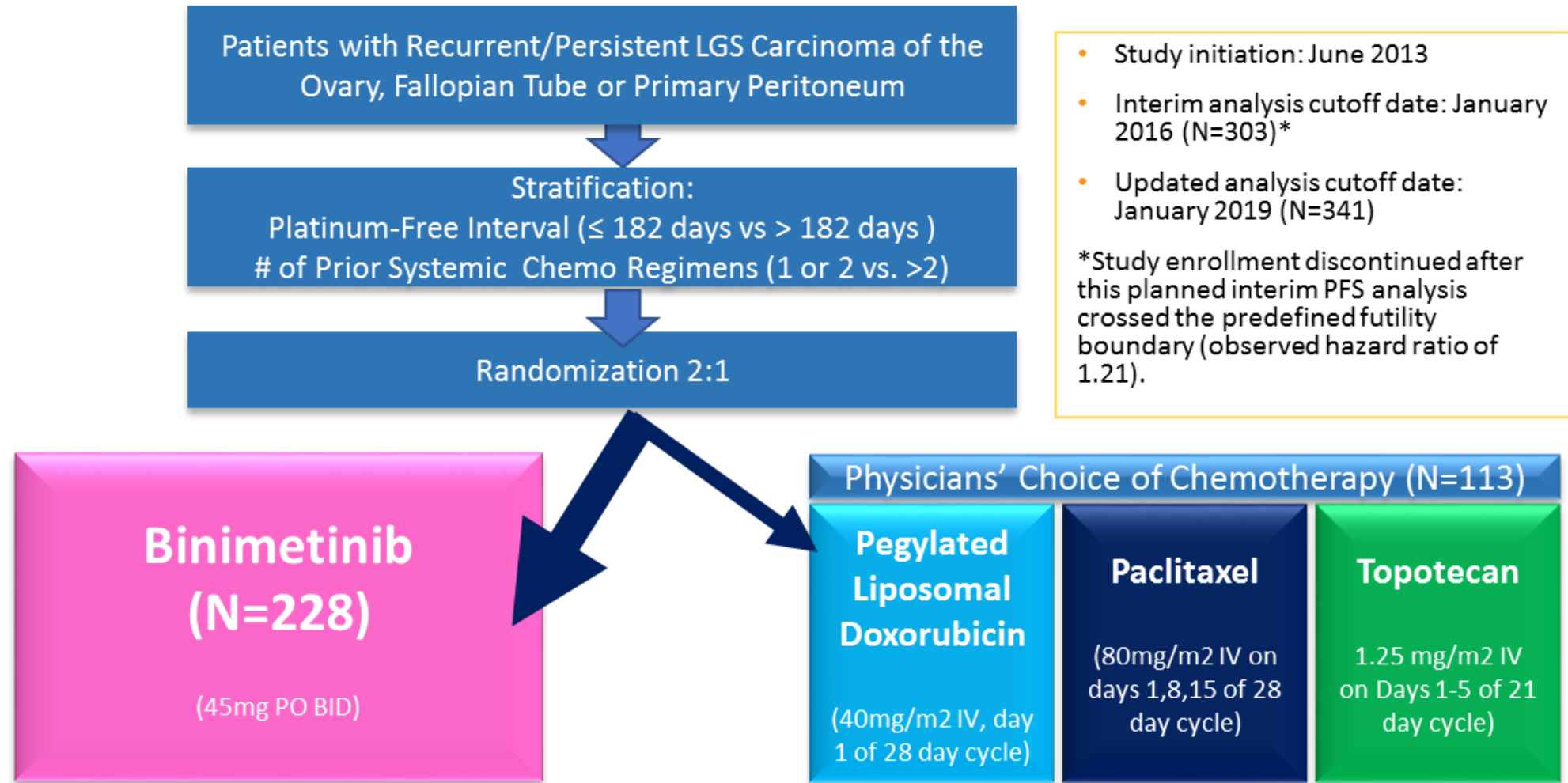
# Frequent MAPK Pathway Alterations

Serous Borderline Tumors (n=11)

Low Grade Serous Cancer (n=18)



# MILO Phase III Study of Binimetinib vs PCC in LGSOC



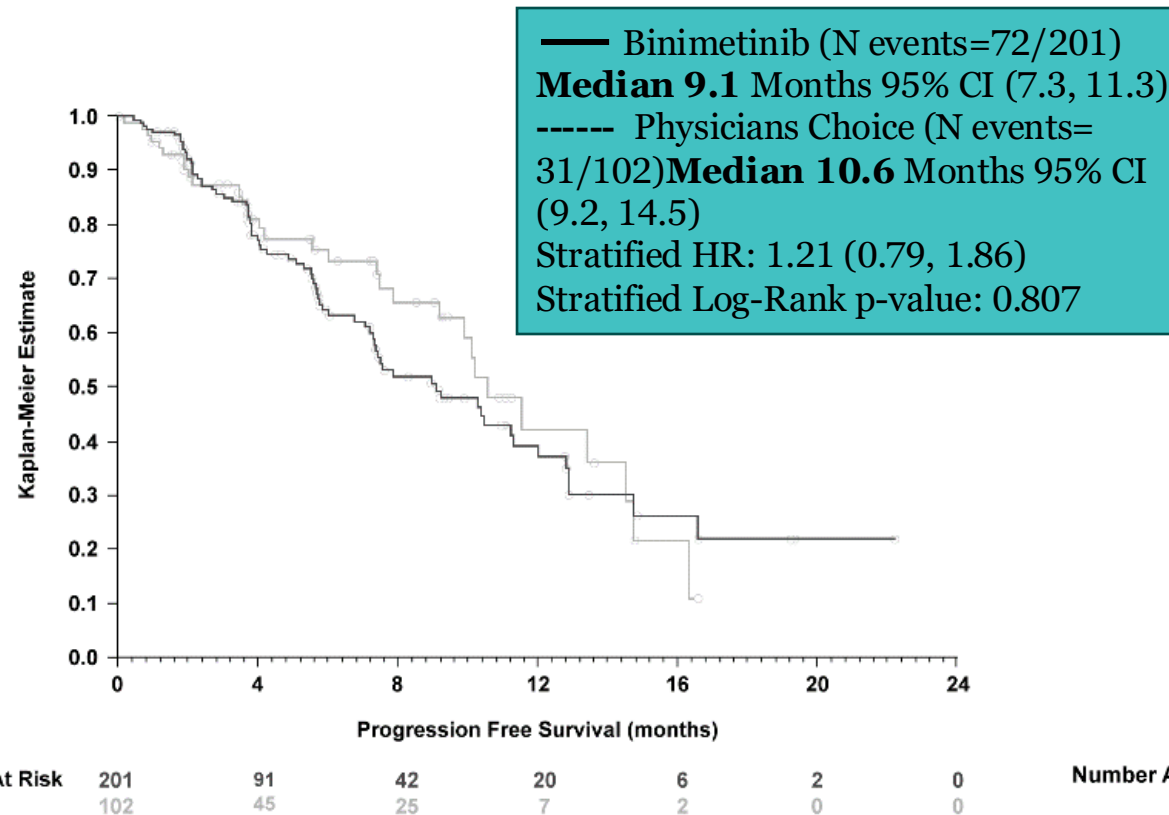
*Presented by Rachel Grisham, IGCS Annual Conference, Brazil, 2019*

*Published: Monk, Grisham, Banerjee, Kalbacher, Mirza, Romero, Vuylsteke, Coleman, Hilpert, Oza, Westermann, Oehler, Pignata, Aghajanian, Colombo, Drill, Cibula, Moore, Bittel, Campo, Berger, Marth, Sehouli, Omalley, Churrua, Boyd, Kristensen, Clamp, Ray-Coquard, Vergote; J Clin Oncol, 2020.*

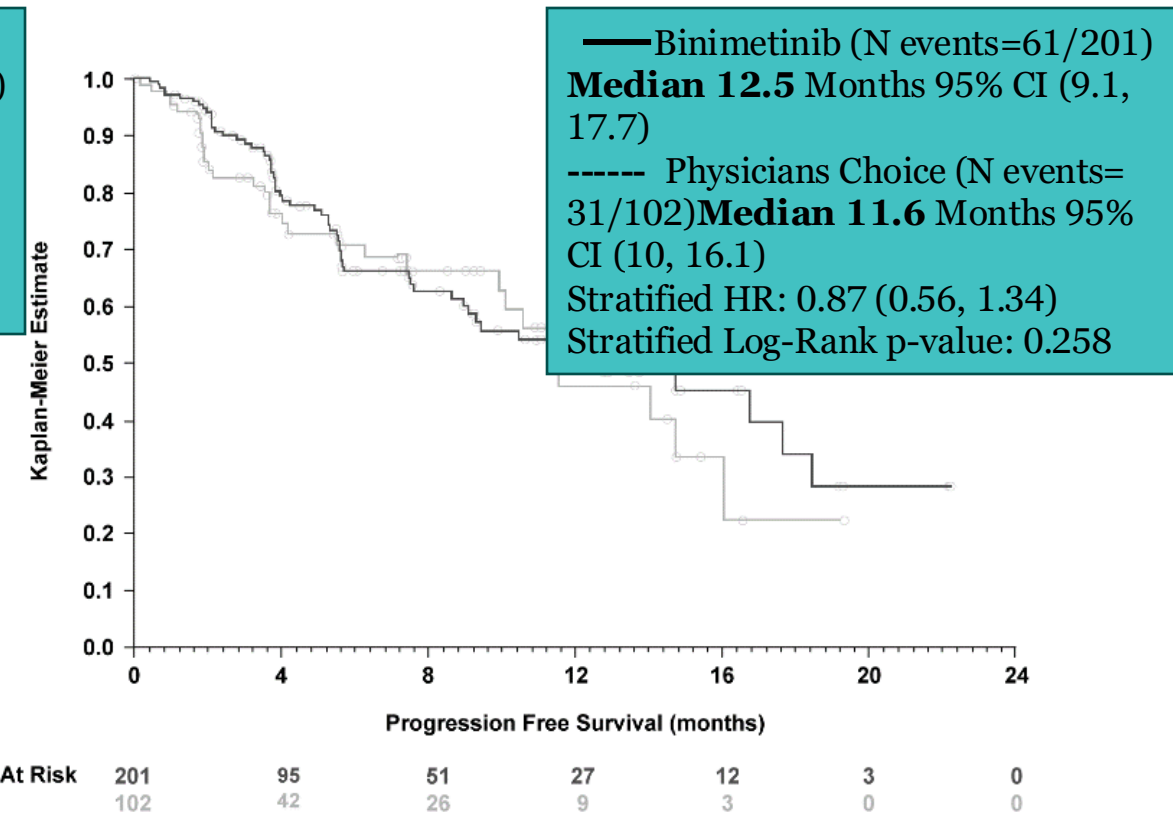
# Interim Analysis

## *Progression Free Survival BICR and Local*

### BICR



### Local



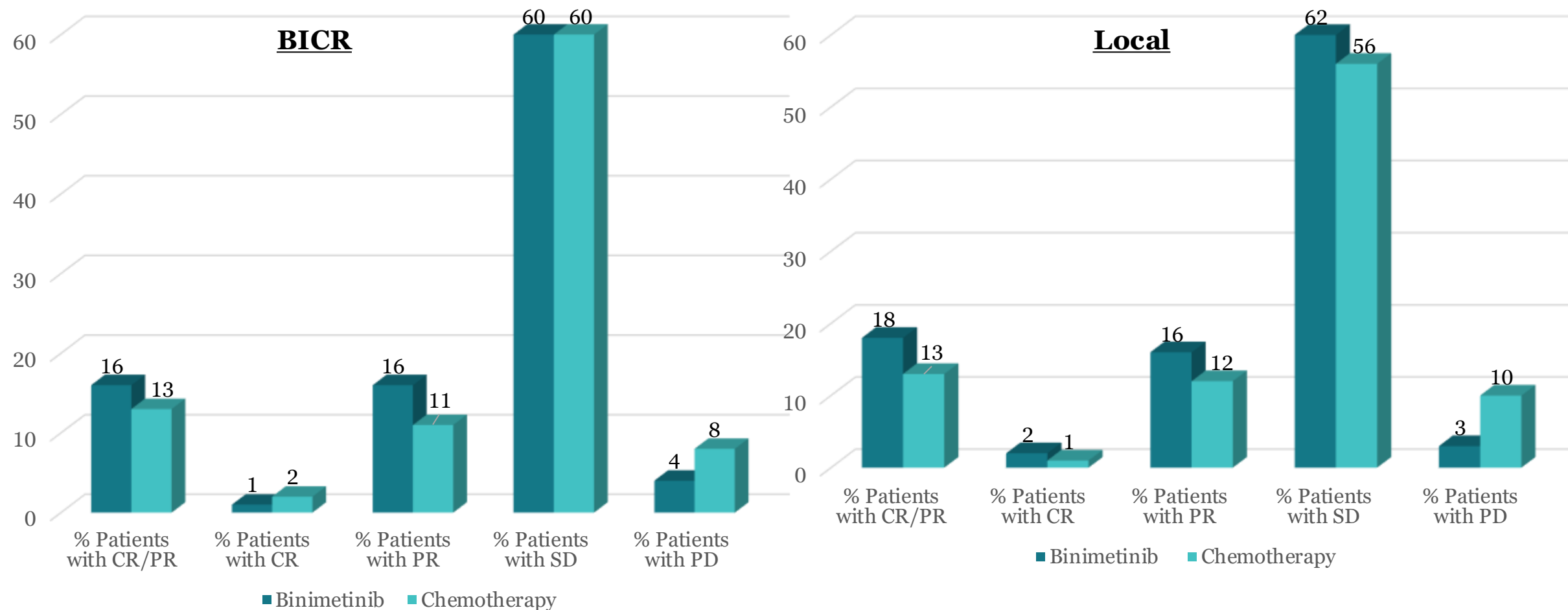
*Presented by Rachel Grisham, IGCS Annual Conference, Brazil, 2019*

*Published: Monk, Grisham, Banerjee, Kalbacher, Mirza, Romero, Vuylsteke, Coleman, Hilpert, Oza, Westermann, Oehler, Pignata, Aghajanian, Colombo, Drill, Cibula, Moore, Bittel, Campo, Berger, Marth, Sehouli, Omalley, Churrua, Boyd, Kristensen, Clamp, Ray-Coquard, Vergote; J Clin Oncol, 2020.*

Interim analysis cutoff date: January 2016 (N=303)

# Interim Analysis

## *Best RECIST Response by BICR and Local*



*Presented by Rachel Grisham, IGCS Annual Conference, Brazil, 2019*

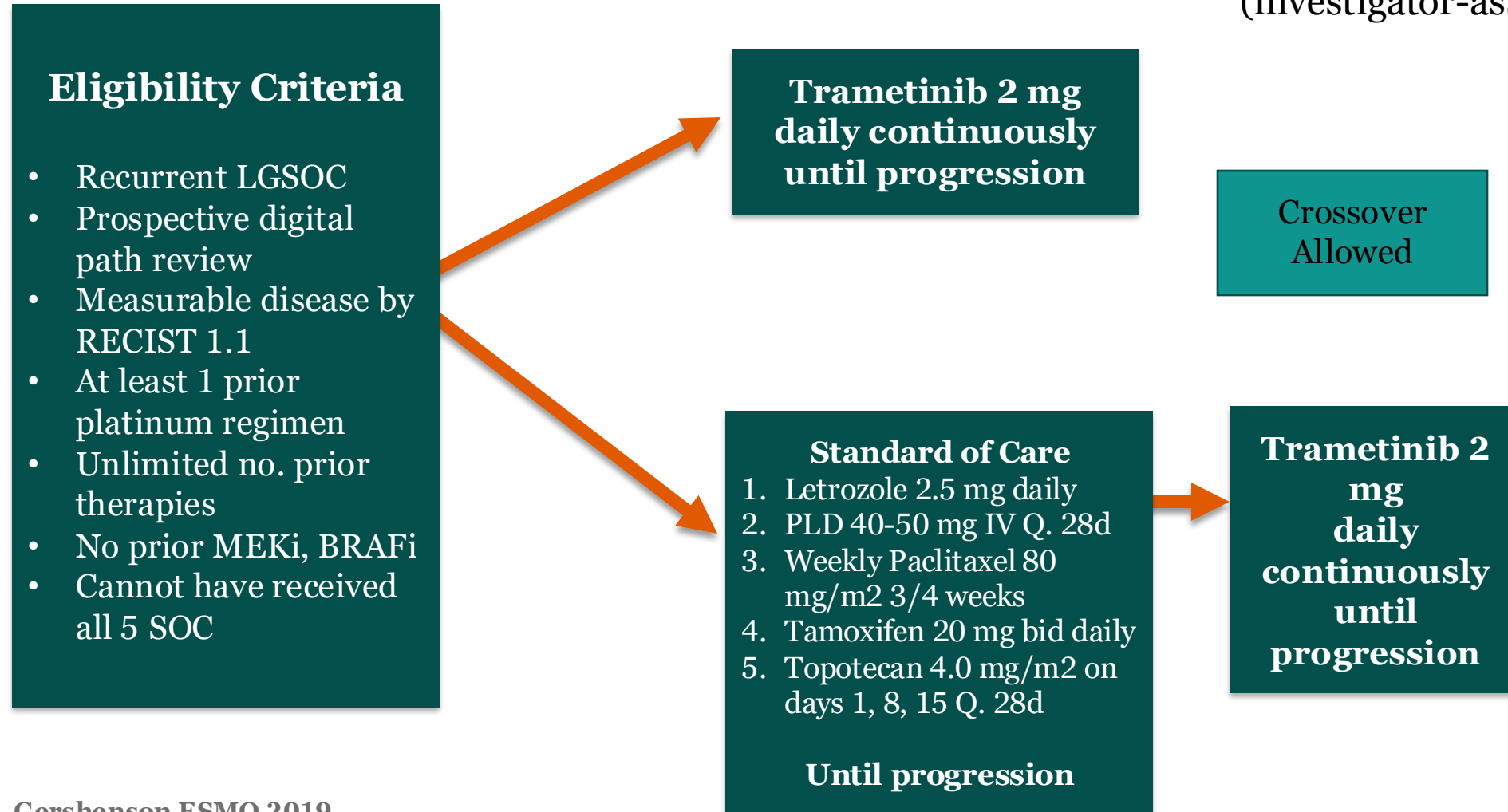
*Published: Monk, Grisham, Banerjee, Kalbacher, Mirza, Romero, Vuylsteke, Coleman, Hilpert, Oza, Westermann, Oehler, Pignata, Aghajanian, Colombo, Drill, Cibula, Moore, Bittel, Campo, Berger, Marth, Sehouli, Omalley, Churrua, Boyd, Kristensen, Clamp, Ray-Coquard, Vergote; J Clin Oncol, 2020.*

Interim analysis cutoff date: January 2016 (N=303)

# NRG-GOG 0281 Study Design

N=260

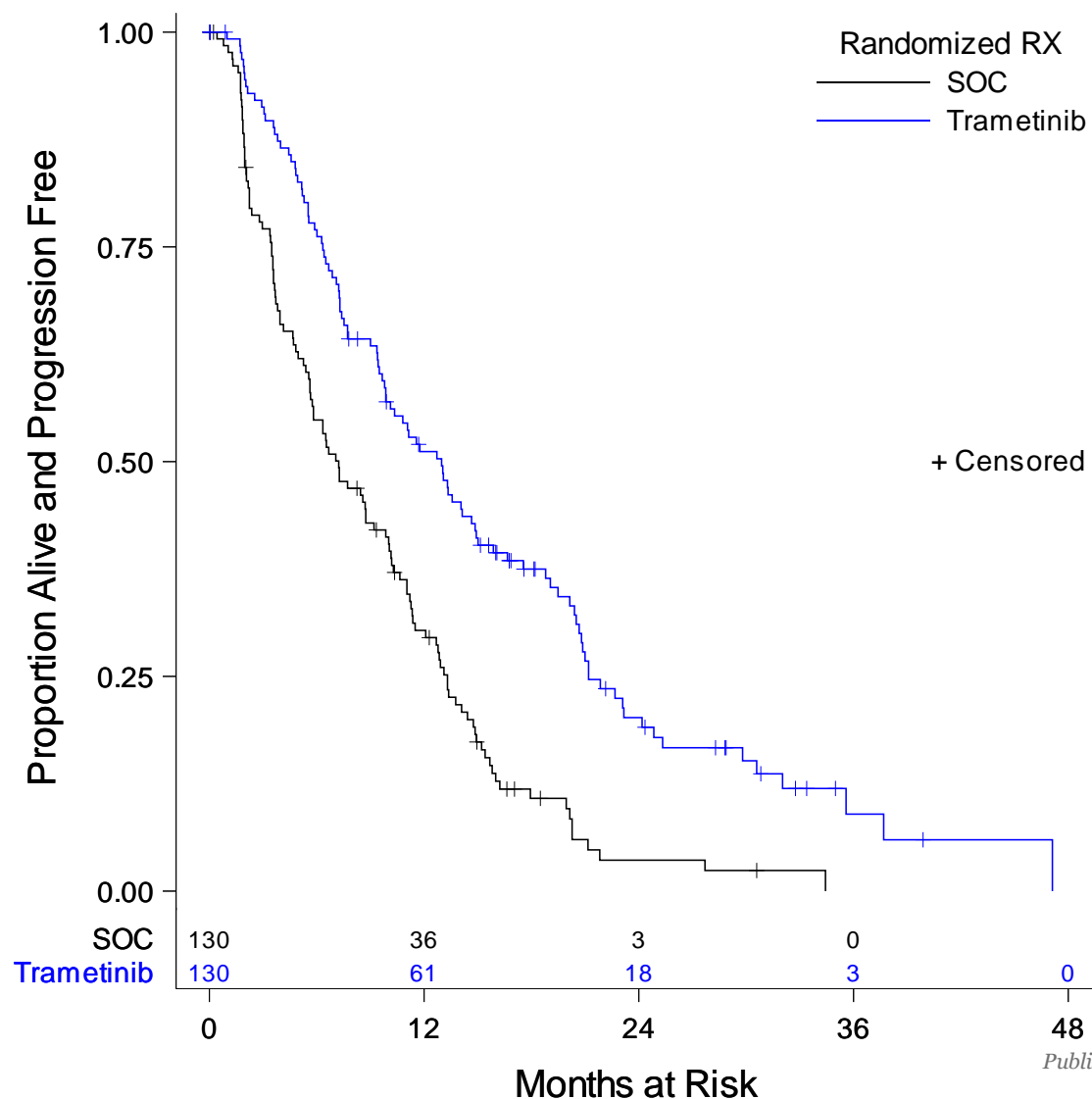
Primary Endpoint: PFS  
(investigator-assessed)



Presented by D. Gershenson ESMO 2019

Published: Gershenson, Miller, Brady, Paul, Carty, Rodgers, Millan, Coleman, Moore, Banerjee, Connolly, Secord, O'Malley, Dorigo, Gaillard, Gabra, Slomovitz, Hanjani, Farley, Churchman, Ewing, Hollis, Herrington, Huang, Wenzel, Gourley, Lancet, 2022.

# Progression-Free Survival by Local Assessment



	Trametinib	Control (SOC)
Median (Months) 95% CI	13.0 (9.9 – 15.0)	7.2 (5.6 - 9.9)
Hazard Ratio 95% CI	0.48 (0.36 – 0.64)	
One-sided p-value	< 0.0001	

Presented by D. Gershenson ESMO 2019

Published: Gershenson, Miller, Brady, Paul, Carty, Rodgers, Millan, Coleman, Moore, Banerjee, Connolly, Secord, O'Malley, Dorigo, Gaillard, Gabra, Slomovitz, Hanjani, Farley, Churchman, Ewing, Hollis, Herrington, Huang, Wenzel, Gourley, Lancet, 2022.



# Response by RECIST 1.1 by Local Assessment

Arm	No. Pts CR + PR /Treated	Objective Response Rate (95% CI)	Stable Disease Rate	Response Duration Months (95% CI)	Odds Ratio For ORR (95% CI)	P-Value
Trametinib	34/130	26.2% (19.0-34.0)	59.2%	13.6 (8.1-18.8)	5.4 (2.4-12.2)	< 0.0001
Control (SOC)	8/130	6.2% (2.0-10.0)	70.8%	5.9 (2.8-12.2)		
Letrozole	6/44	13.6%	70.5%			
Tamoxifen	0/27	0%	66.7%			
Paclitaxel	1/11	9.1%	63.6%			
PLD	1/40	2.5%	80.0%			
Topotecan	0/8	0%	50.0%			

# There Are No FDA Approved Options For Recurrent LGSOC



National  
Comprehensive  
Cancer  
Network®

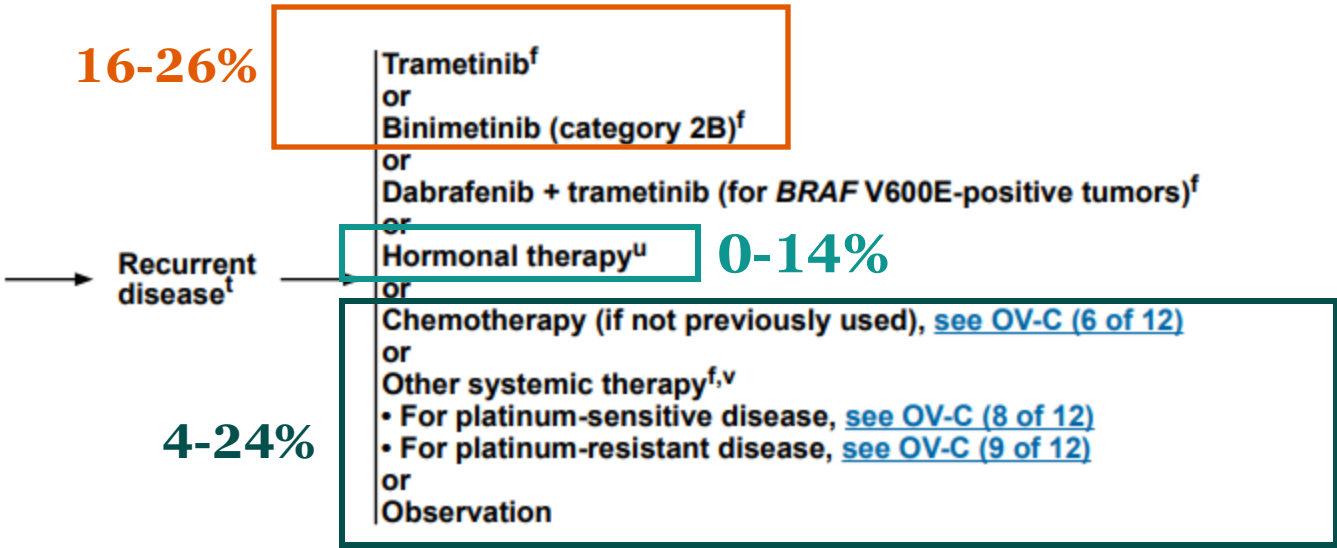
## NCCN Guidelines Version 3.2024 Low-Grade Serous Carcinoma

All Currently Available  
Therapies for LGSOC  
Generally have  
Response Rates  $\leq 26\%$

### MONITORING/FOLLOW-UP FOR RECURRENCE

- Visits every 2–4 mo for 2 y, then 3–6 mo for 3 y, then annually after 5 y
- Physical exam including pelvic exam as clinically indicated
- Tumor molecular testing if not previously done<sup>o</sup>
- C/A/P CT, MRI, PET/CT, or PET (skull base to mid-thigh) as clinically indicated<sup>p</sup>
- CBC and chemistry profile as indicated
- CA-125<sup>q</sup> or other tumor markers if initially elevated
- Refer for genetic risk evaluation, if not previously done<sup>r</sup>
- Long-term wellness care ([NCCN Guidelines for Survivorship](#))

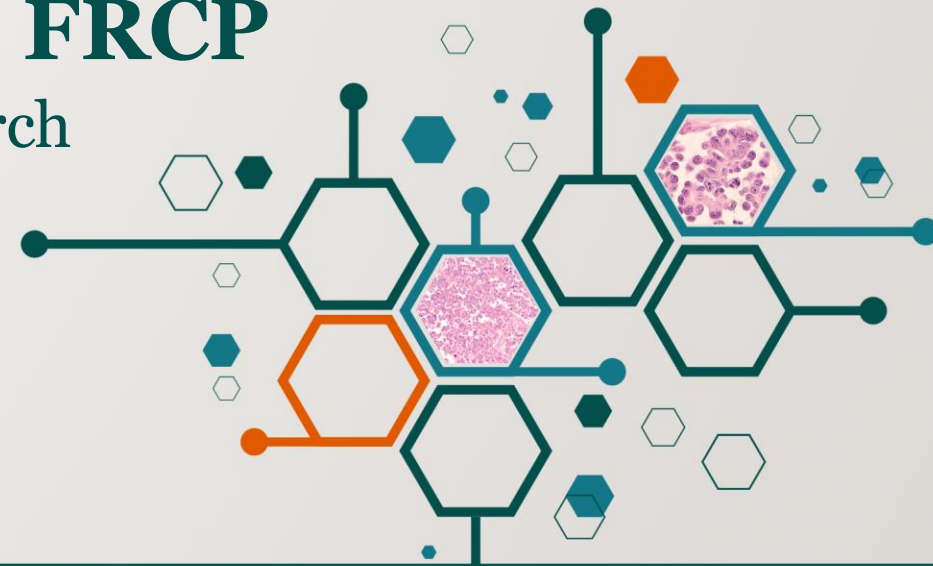
### RECURRENCE THERAPY<sup>s</sup>



# Latest Data and Future Directions

**Susana Banerjee, MBBS, MA, PhD, FRCP**

The Royal Marsden and the Institute of Cancer Research  
United Kingdom



# New Treatment Options Are Needed for Patients With LGSOC

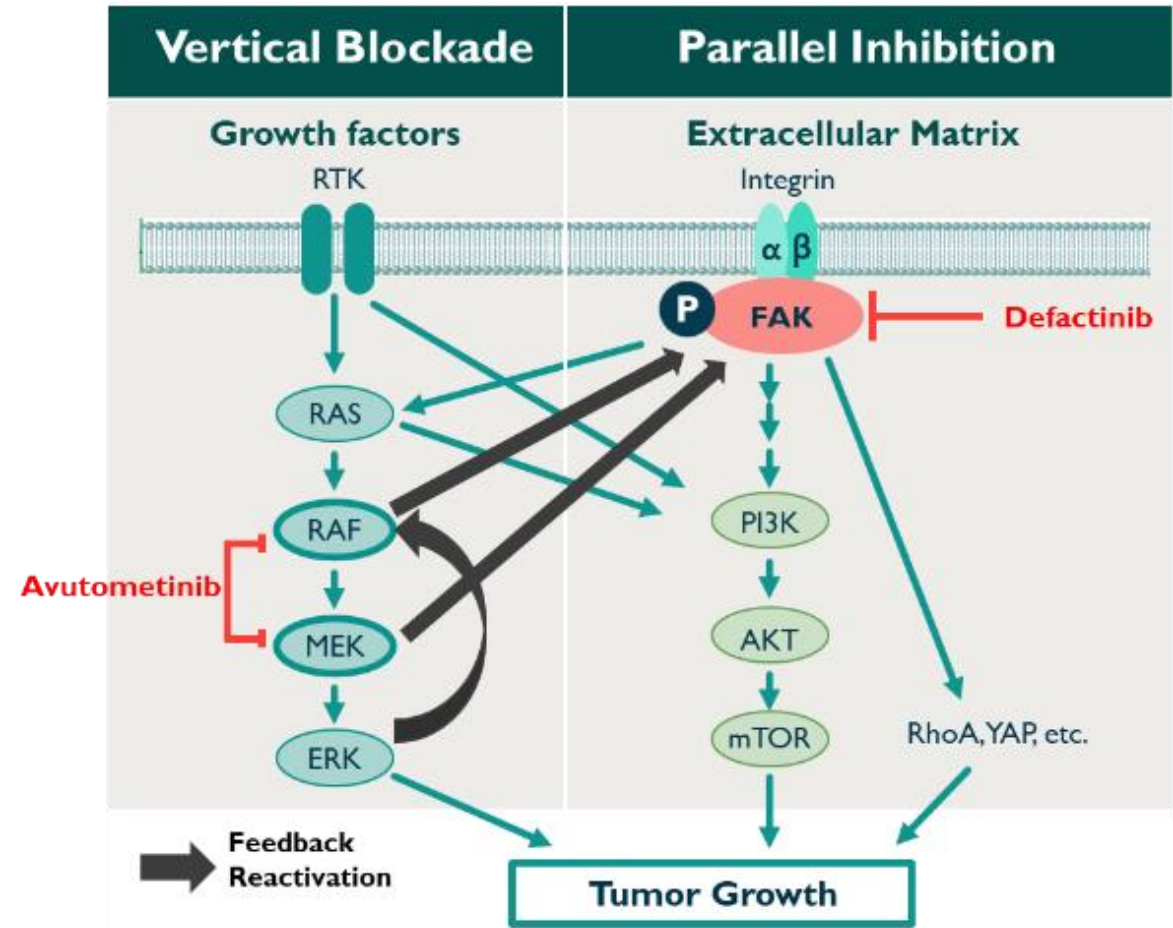
- LGSOC is a rare, histopathologically, molecularly, and clinically distinct cancer accounting for <10% of new epithelial ovarian cancers<sup>1,2</sup>
- LGSOC is commonly driven by alterations in the RAS/MAPK pathway, including KRAS mutations, which occur in approximately 30% of patients<sup>3,4</sup>
- Molecular alterations may influence patient outcomes
  - KRAS mutations/MAPK alterations are associated with improved prognosis<sup>1,5,6</sup>
- Chemotherapy options have shown limited efficacy in LGSOC (ORR 0%–13%)<sup>5,7</sup>
- Response rates of 26% and 16% were observed with trametinib and binimetinib, respectively, but with discontinuation rates of 36% and 31% due to toxicity<sup>5,7</sup>

*KRAS, Kirsten rat sarcoma virus; LGSOC, low-grade serous ovarian cancer; MAPK, mitogen-activated protein kinase; ORR, objective response rate.*

*1. Grisham RN, et al. Int J Gynecol Cancer. 2023;33(9):1331-1344; 2. Matsuo K, et al. J Gynecol Oncol. 2018;29(1a):e15; 3. Manning-Geist B, et al. Clin Cancer Res. 2022;28(20):4456-4465; 4. ElNaggar A, et al. Gynecol Oncol. 2022;167(2):306-313; 5. Gershenson DM, et al. Lancet. 2022;399(10324):541-553; 6. Manning-Geist BL, et al. Clin Adv Hematol Oncol. 2024;22(5):205-226; 7. Monk BJ, et al. J Clin Oncol. 2020;38(32):3753-3762.*

# Avutometinib and Defactinib Mechanism of Action

- **Avutometinib** is a first-in-class oral RAF/MEK clamp that potently inhibits MEK while also blocking the compensatory reactivation of MEK by upstream RAF<sup>1,2</sup>
- **Defactinib** is a selective inhibitor of FAK, a key adaptive resistance mechanism to the RAS/MAPK pathway<sup>3-5</sup>
- The clinical activity of avutometinib + defactinib demonstrated in the phase 1 FRAME study (NCT03875820) led to FDA Breakthrough Therapy Designation and rationale for the phase 2 ENGOT-ov60/GOG-3052/RAMP 201 (NCT04625270) study<sup>6,7</sup>



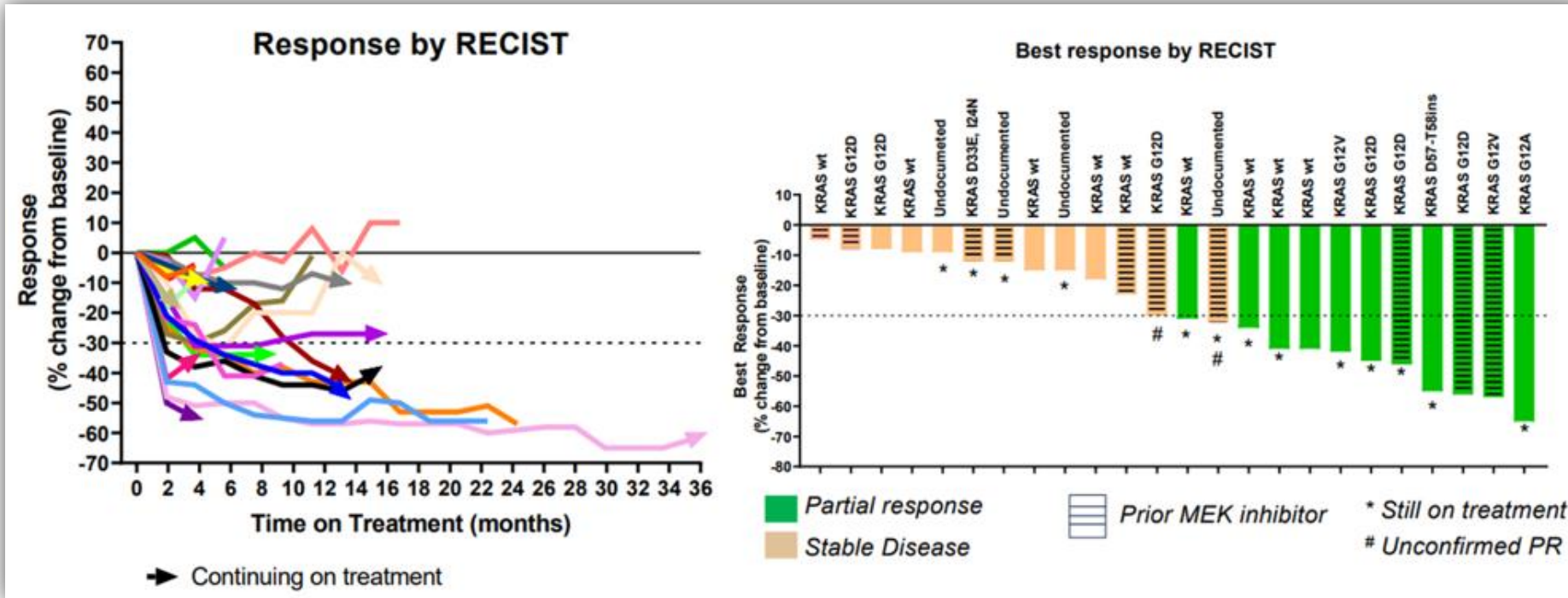
ERK; extracellular signal-regulated kinase; FAK, focal adhesion kinase; KRAS, kirsten rat sarcoma virus; LGSOC, low-grade serous ovarian cancer. MAPK, mitogen-activated protein kinase; MEK, mitogen-activated extracellular signal-regulated kinase; mTOR, mammalian target of rapamycin; P, phosphate; PI3K, phosphatidylinositol 3-kinase; RAF, rapidly accelerated fibrosarcoma; RAS, rat sarcoma virus; RhoA, Ras homolog family member A; RTK, receptor tyrosine kinase; YAP, Yes-associated protein.

1. Lito P, et al. Cancer Cell. 2014;25(5):697-710; 2. Gonzalez-Del Pino GL, et al. Proc Natl Acad Sci U S A. 2021;118(36):e2107207118; 3. Dawson JC, et al. Nat Rev Cancer. 2021;21:313-324; 4. Shinde R, et al. Cancer Res. 2020;80(suppl 16):CT143; 5. Kang Y, et al. J Natl Cancer Inst. 2013;105(19):1485-1495; 6. Banerjee S, et al. Ann Oncol. 2021;32(suppl 5):S728; 7. Verastem Oncology. Press Release: Verastem Oncology Receives Breakthrough Therapy Designation for VS-6766 with Defactinib in Recurrent Low-Grade Serous Ovarian Cancer. May 24, 2021. Accessed September 28, 2023. <https://investor.verastem.com/node/12421/pdf>.

Avutometinib and defactinib are investigational drugs and have not been approved for use by any regulatory health authority. Safety and efficacy have not been established.



# Phase 1 FRAME trial VS-6766 + Defactinib LGSC cohort



G3/G4 AE 32%  
12% CPK elevation  
8% rash  
4% mucositis  
4% hyperbilirubinemia

**Overall response rate (ORR) = 46% (11/24)**  
KRAS mutant ORR = 64% (7/11)  
KRAS wild-type ORR = 44% (4/9)  
KRAS status undetermined (3 SD; 1 unconfirmed PR)  
Responses in patients previously treated with MEKi  
Median PFS 23 months (95% CI 10.6-NR) across all LGSOC

# Efficacy and Safety of Avutometinib ± Defactinib in Recurrent Low-Grade Serous Ovarian Cancer:

## Primary Analysis of ENGOT-OV60/GOG-3052/RAMP 201

Susana N. Banerjee, Carol Aghajanian, Els Van Nieuwenhuysen, Alessandro D. Santin, Kari L. Ring, Nicoletta Colombo, Premal H. Thaker, Emily N. Prendergast, Kathleen N. Moore, Hye Sook Chon, Andrew R. Clamp, David M. O'Malley, Bradley J. Monk, Alfonso Cortés Salgado, Michel Fabbro, Elsa Kalbacher, Toon Van Gorp, Stephanie Lustgarten, Hagop Youssoufian, Rachel N. Grisham





# ENGOT-ov60/GOG-3052/RAMP 201:

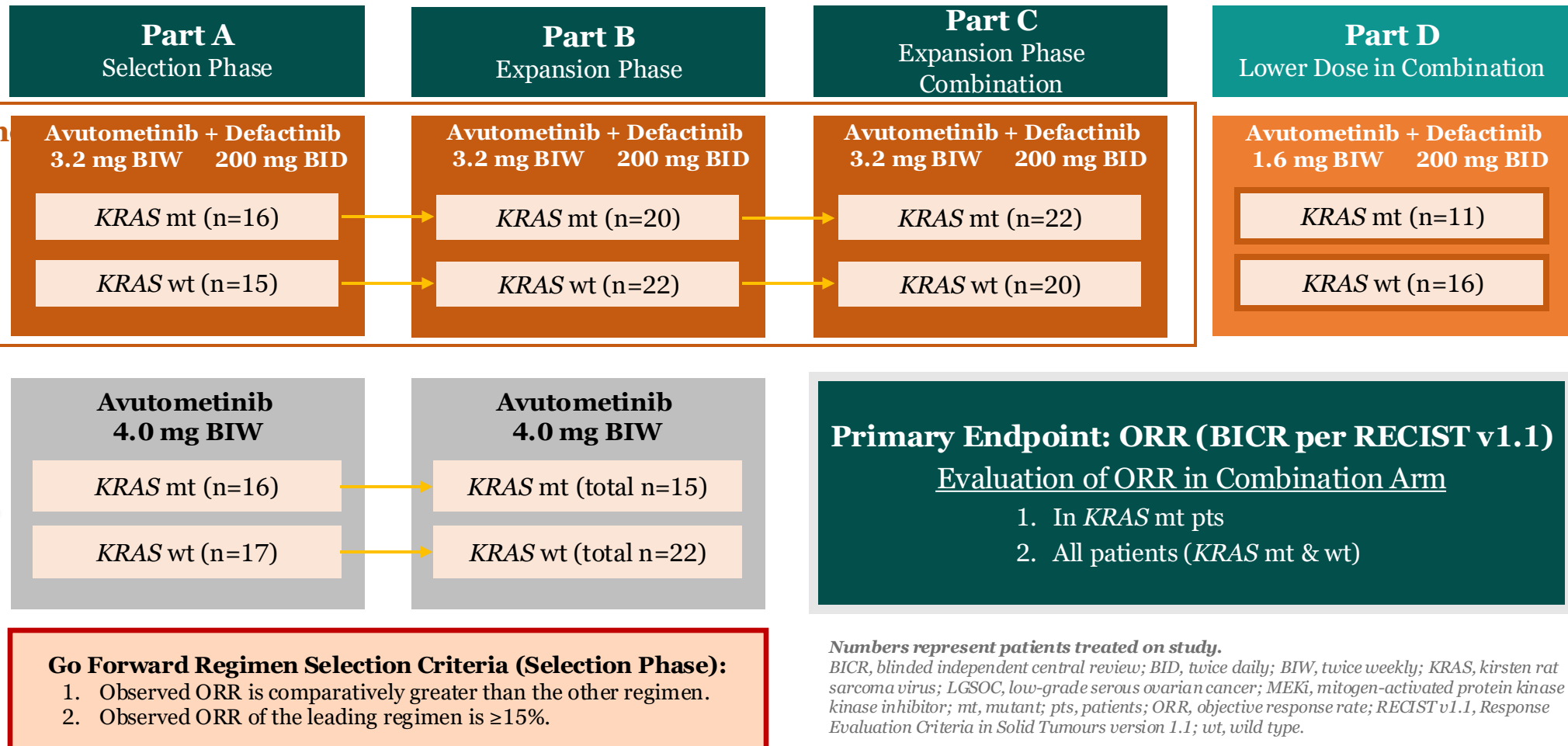
## Registration-Directed Phase 2 Trial of Avutometinib ± Defactinib in Patients With Recurrent LGSOC

### Go Forward Regimen

#### Key Inclusion Criteria

- Recurrent LGSOC
- Prior platinum chemotherapy
- Measurable disease (RECIST v1.1)
- Prior MEKi allowed

Oral dosing for  
monotherapy and  
combination therapy:  
3 weeks on/1 week off



**Numbers represent patients treated on study.**

BICR, blinded independent central review; BID, twice daily; BIW, twice weekly; KRAS, kirsten rat sarcoma virus; LGSOC, low-grade serous ovarian cancer; MEKi, mitogen-activated protein kinase kinase inhibitor; mt, mutant; pts, patients; ORR, objective response rate; RECIST v1.1, Response Evaluation Criteria in Solid Tumours version 1.1; wt, wild type.

# Baseline Characteristics: Parts A, B, & C

	Avutometinib + Defactinib 3.2 mg BIW + 200 mg BID 3 weeks on/1 week off			Avutometinib Monotherapy 4.0 mg BIW 3 weeks on/1 week off		
	All patients N=115	KRAS mt N=58	KRAS wt N=57	All patients N=70	KRAS mt N=31	KRAS wt N=39
Age, median (min, max), y	54 (21, 87)	60 (29, 87)	45 (21, 80)	54 (21, 77)	57 (27, 74)	48 (21, 77)
ECOG PS, n (%)						
0	78 (68)	42 (72)	36 (63)	50 (71)	19 (61)	31 (80)
1	37 (32)	16 (28)	21 (37)	20 (29)	12 (39)	9 (20)
# of prior systemic regimens, median (min, max)	3 (1, 9)	3 (1, 9)	3 (1, 9)	3 (1, 10)	3 (1, 10)	3 (1, 9)
Prior platinum-based chemotherapy, n (%) <sup>*</sup>	114 (99)	58 (100)	56 (98)	69 (99)	30 (97)	39 (100)
Prior hormonal therapy, n (%)	99 (86)	49 (84)	50 (88)	58 (83)	25 (81)	33 (85)
Prior bevacizumab, n (%)	59 (51)	23 (40)	36 (63)	34 (49)	17 (55)	17 (44)
Prior MEK inhibitor therapy, n (%)	25 (22)	12 (21)	13 (23)	18 (26)	8 (26)	10 (26)

Avutometinib + defactinib group: 77% of patients were White; 4% Asian; 4% Black or African American; 4% other; 11% not reported

Avutometinib monotherapy group: 85% of patients were White; 3% Asian; 3% Black or African American; 2% other; 1% unknown; 7% not reported

<sup>\*</sup>2 pts without prior platinum received anastrozole only (1 in the monotherapy and 1 in combination arm)

BID, twice daily; BIW, twice weekly; ECOG PS, Eastern Cooperative Oncology Group performance status; KRAS, kirsten rat sarcoma virus; MEK, mitogen-activated protein kinase kinase; mt, mutant; wt, wild type.

# Patient Disposition: Parts A, B, & C

- Median follow-up in the combination group = 13.6 months (range, 1.4–39.5)
- In the combination group, mean relative dose intensity of 0.84 for avutometinib and 0.77 for defactinib

	Avutometinib + Defactinib 3.2 mg BIW + 200 mg BID 3 weeks on/1 week off			Avutometinib Monotherapy 4.0 mg BIW 3 weeks on/1 week off		
	All patients	KRAS mt	KRAS wt	All patients	KRAS mt	KRAS wt
Patients treated	115	58	57	70	31	39
Patients on treatment, n (%)	32 (28)	24 (41)	8 (14)	10 (14)	8 (26)	2 (5)
Patients discontinued treatment, n (%)	83 (72)	34 (59)	49 (86)	60 (86)	23 (74)	37 (95)
Primary reason for discontinuation						
RECIST v1.1 disease progression	46 (40)	18 (31)	28 (49)	33 (47)	14 (45)	19 (49)
Adverse event/unacceptable toxicity	12 (10)	4 (7)	8 (14)	11 (16)	4 (13)	7 (18)
Withdrawal of informed consent	10 (9)	4 (7)	6 (11)	6 (9)	3 (10)	3 (8)
Other*	10 (9)	5 (9)	5 (9)	4 (6)	2 (6)	2 (5)
Clinical deterioration	5 (4)	3 (5)	2 (4)	5 (7)	0	5 (13)
Death	0	0	0	1 (1)	0	1 (3)

Discontinuations due to AEs/unacceptable toxicity were reported in 10% of patients in the avutometinib + defactinib group  
Visit cutoff date: 30 June 2024

*\*Other includes: clinical progression (n=8) and progression confirmed by biopsy/pathology report, progression by confirmation of cytology from pleural effusion showing malignant etiology, debulking surgery, patient noncompliance, patient withdrawal with agreement to follow-up, physician decision (1 each).*

*AE, adverse event; BID, twice daily; BIW, twice weekly; KRAS, Kirsten rat sarcoma virus; mt, mutant; RECIST v1.1, Response Evaluation Criteria in Solid Tumours version 1.1; wt, wild type.*

# Response Rate and Duration of Response: Parts A, B, & C

In the avutometinib + defactinib combination group

## RECIST 1.1 Objective Response Rate by BICR

(primary endpoint):

- **31% overall; 44% KRAS mt, 17% KRAS wt**
- **33% without prior MEKi, 24% with prior MEKi**
- **Median time to response: 3.7 months (range, 1.7 – 19.2)**
- **Median duration of response: 31.1 months (95% CI, 14.8, 31.1)**

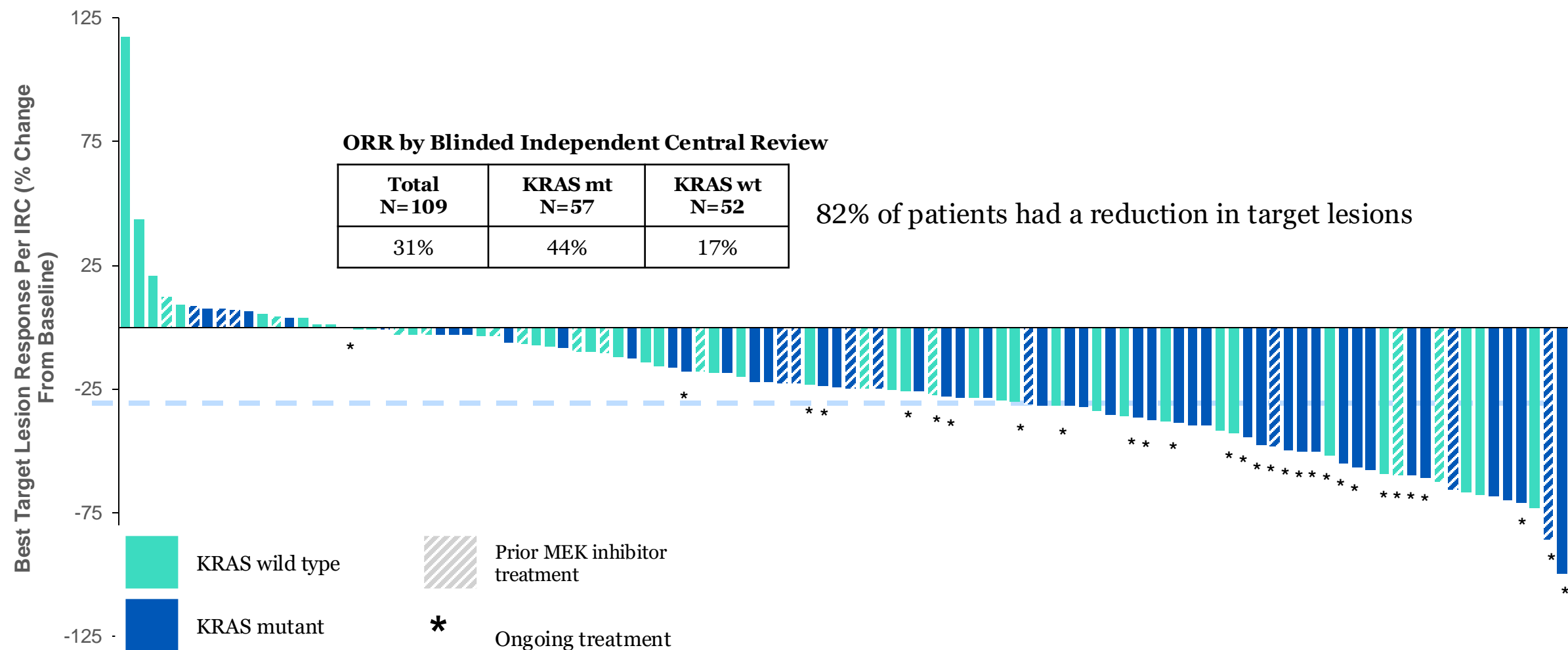
	Avutometinib + Defactinib 3.2 mg BIW + 200 mg BID 3 weeks on/1 week off			Avutometinib Monotherapy 4.0 mg BIW 3 weeks on/1 week off		
	All patients N=109	KRAS mt N=57	KRAS wt N=52	All patients N=69	KRAS mt N=30	KRAS wt N=39
Confirmed* ORR, n (%)	<b>34 (31)</b>	<b>25 (44)</b>	<b>9 (17)</b>	12 (17)	7 (23)	5 (13)
CR	2 (2)	2 (4)	0	1 (1)	1 (3)	0
PR	32 (29)	23 (40)	9 (17)	11 (16)	6 (20)	5 (13)
DOR, median (95% CI), mo	31.1 (14.8, 31.1)	31.1 (14.8, 31.1)	9.2 (5.5, NE)	NE <sup>‡</sup>	NE <sup>‡</sup>	NE <sup>‡</sup>
SD, <sup>†</sup> n (%)	62 (57)	28 (49)	34 (65)	43 (62)	17 (57)	26 (67)
PD, n (%)	9 (8)	2 (4)	7 (13)	7 (10)	3 (10)	4 (10)
Not evaluable, n (%)	4 (4)	2 (4)	2 (4)	7 (10)	3 (10)	4 (10)

Efficacy evaluable population includes patients who received at least one dose of study drug and had measurable disease at baseline by BICR.  
Patients not evaluable for response did not have a postbaseline assessment but are included in the denominator for the efficacy evaluable population.

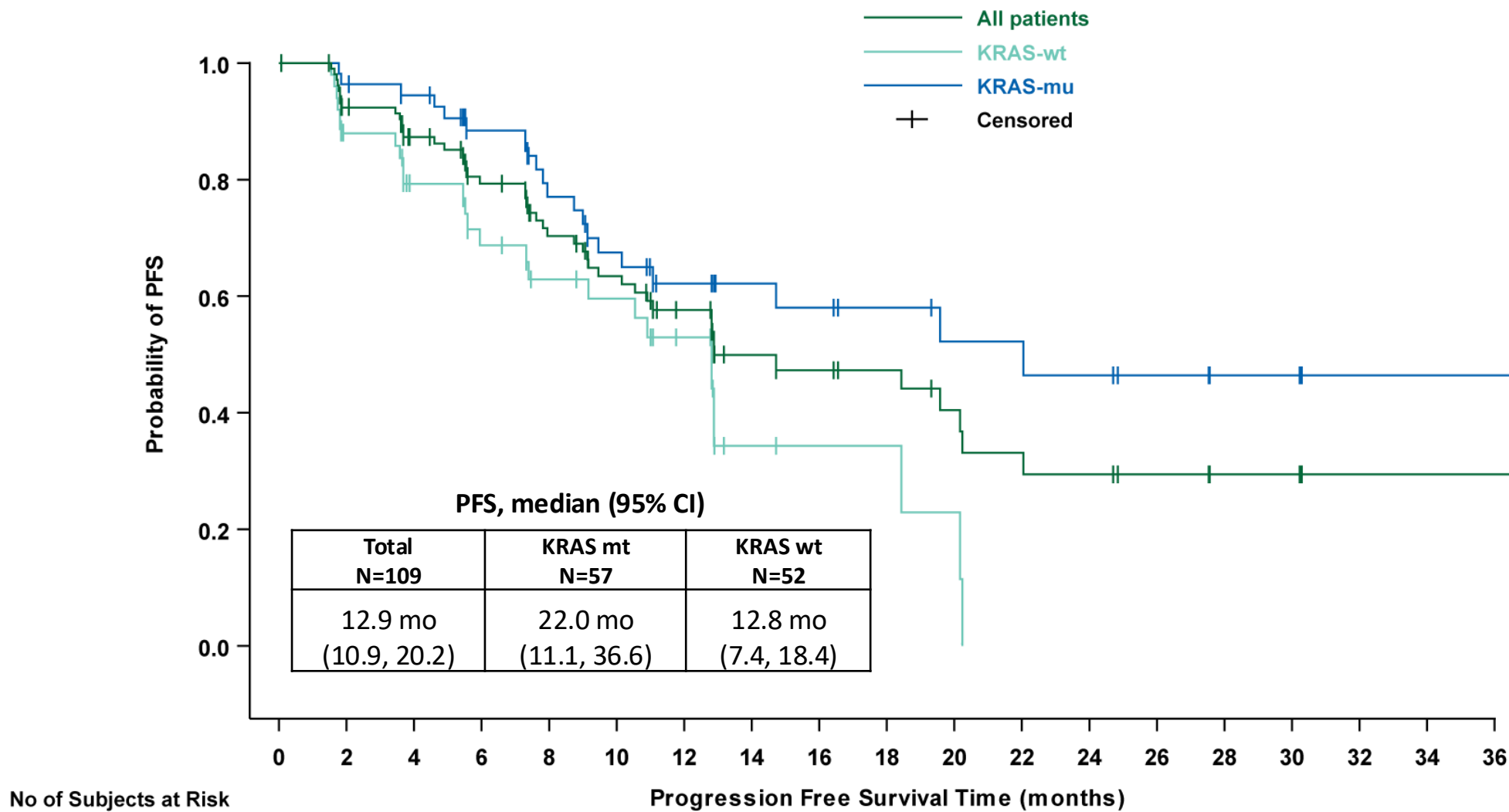
\*By BICR. †Includes unconfirmed PR; SD (or unconfirmed PR) must occur ≥53 days after first dose date. ‡NE = Could not be estimated based on number of patients with loss of response.  
BICR, blinded independent central review; BID, twice daily; BIW, twice weekly; CR, complete response; DOR, duration of response; KRAS, kirsten rat sarcoma virus; MEK, mitogen-activated protein kinase kinase;  
mt, mutant; ORR, objective response rate; PD, progressive disease; PR, partial response; RECIST v1.1, Response Evaluation Criteria in Solid Tumours version 1.1; SD, stable disease; wt, wild type

# Best Percentage Change From Baseline in Target Lesions

## Avutometinib + Defactinib: Parts A, B, and C



# Progression-Free Survival: Avutometinib + Defactinib: Parts A, B, & C



ClinicalTrials.gov identifier: NCT04625270

KRAS, kirsten rat sarcoma virus; mt, mutant; PFS, progression-free survival; wt, wild type.

Avutometinib and defactinib are investigational drugs and have not been approved for use by any regulatory health authority. Safety and efficacy have not been established.

# Adverse Events Profile for Avutometinib + Defactinib: Parts A, B, & C

- 80% (92/115) of patients had AEs leading to **dose interruption**
  - 38% (44/115) for elevations in CPK
- 36.5% (42/115) of patients had AEs leading to **dose reduction**
- 10% (12/115) of patients **discontinued for AEs**; most common increased CPK (n=4)
- 7% (8/115) of patients had **serious AEs** considered by the investigator to be related to study treatment: the only event occurring in more than 1 patient was abdominal pain
- 4 **deaths** (within 30 days of discontinuation): GI hemorrhage, large intestine perforation, clinical progression, clinical deterioration (none considered related to study treatment)

Treatment-Related Adverse Events (>20% of patients)* n (%)	Avutometinib + Defactinib 3.2 mg BIW + 200 mg BID 3 weeks on/1 week off N= 115	
Preferred term	All Grades	Grade ≥3
Non-laboratory AEs		
Nausea	77 (67.0)	3 (2.6)
Diarrhea	67 (58.3)	9 (7.8)
Oedema peripheral	61 (53.0)	1 (0.9)
Fatigue	50 (43.5)	3 (2.6)
Vomiting	49 (42.6)	3 (2.6)
Vision blurred	47 (40.9)	0
Rash	41 (35.7)	2 (1.7)
Dermatitis acneiform	39 (33.9)	5 (4.3)
Dry skin	30 (26.1)	0
Anemia	26 (22.6)	6 (5.2)
Laboratory-related AEs		
Increased blood CPK	69 (60.0)	28 (24.3)
Increased blood bilirubin increased/hyperbilirubinemia	38 (33.0)	5 (4.3)
AST increased	36 (31.3)	2 (1.7)

*\*Most common adverse events (preferred term) considered by the investigator to be related to study drug (either avutometinib or defactinib).  
AE, adverse event; AST, aspartate aminotransferase; BID, twice daily; BIW, twice weekly; CPK, creatine phosphokinase; GI, gastrointestinal.*

# Adverse Events Profile for Avutometinib + Defactinib: Parts A, B, & C

BID, twice daily; BIW, twice weekly; MEK, mitogen-activated protein kinase kinase.  
ClinicalTrials.gov identifier: NCT04625270

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Adverse events of interest that have been associated with MEK inhibitors

Treatment-Related Adverse Events, n (%)*	Avutometinib + Defactinib 3.2 mg BIW + 200 mg BID 3 weeks on/1 week off N=115		
	Preferred term	All Grades	Grade ≥3
Ocular events			
Blurred vision	47 (40.9)	0	
Visual impairment	7 (6.1)	0	
Retinal pigment epithelial detachment	6 (5.2)	0	
Retinal detachment	4 (3.5)	0	
Serous retinal detachment	2 (1.7)	0	
Serous retinopathy	2 (1.7)	0	
Retinopathy	2 (1.7)	0	
Retinal vein occlusion	1 (0.9)	0	
Pneumonitis	1 (0.9)	0	
Hypertension	4 (3.5)	1 (0.9)	
Ejection fraction decreased	1 (0.9)	0	
Congestive heart failure	0	0	

\*Adverse events (preferred term) considered by the investigator to be related to study drug (either avutometinib or defactinib).



# Low-Dose Avutometinib Evaluation: Part D

- The **low-dose regimen** of avutometinib (1.6 mg BIW) + defactinib (200 mg BID) evaluated in Part D was determined to be **suboptimal** based on the predefined analysis
  - **Suboptimal threshold:** disease progression by second scheduled assessment (Cycle 5 Day 1) >50% higher than that observed with avutometinib 3.2 mg BIW + defactinib

IRC Assessment	Avutometinib 3.2 mg + 200 mg Defactinib 3 weeks on/1 week off N=109	Avutometinib 1.6 mg + 200 mg Defactinib 3 weeks on/1 week off N=23	% Difference
RECIST v1.1 progressive disease within 4 months	13 (12%)	5 (22%)	+83%

- Therefore, the low-dose regimen will not be pursued as a starting dose in the treatment of recurrent LGSOC

BID, twice daily; BIW, twice weekly; IRC, independent review committee; LGSOC, low-grade serous ovarian cancer; RECIST v1.1, Response Evaluation Criteria in Solid Tumours version 1.1.

Avutometinib and defactinib are investigational drugs and have not been approved for use by any regulatory health authority. Safety and efficacy have not been established.

ClinicalTrials.gov identifier: NCT04625270

# Summary and Conclusions

- In women with recurrent LGSOC with few available treatment options, the combination of avutometinib 3.2 mg BIW + defactinib 200 mg BID resulted in clinically meaningful responses, duration of response, and progression-free survival
  - **ORR:** 31% overall; 44% in KRAS mt and 17% in KRAS wt
  - **Median DOR:** 31 months overall
  - **Median PFS:** 12.9 months overall; 22.0 months in KRAS mt and 12.8 months in KRAS wt
- The safety profile of the combination was consistent with previous reports
  - The majority of adverse events were grade 1 and 2
  - The majority of adverse events were managed with dose interruptions and reductions
  - Discontinuation rate of 10% for adverse events
- These data support the potential for avutometinib + defactinib as a new standard of care for recurrent LGSOC, regardless of KRAS status

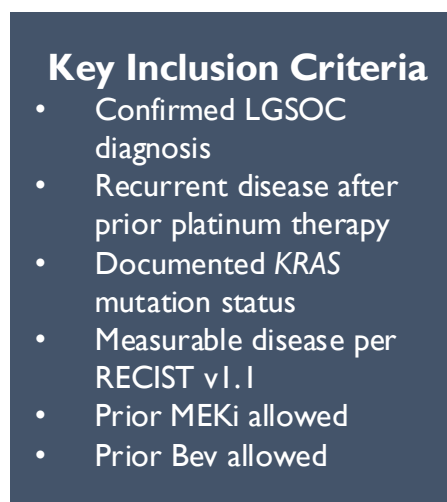
*A phase 3 trial (GOG-3097/ENGOT-OV81/NCRI/RAMP 301) comparing avutometinib + defactinib to investigator's choice of therapy in recurrent LGSOC is enrolling*

BID, twice daily; BIW, twice weekly; DOR, duration of response; KRAS, kirsten rat sarcoma virus; LGSOC, low-grade serous ovarian cancer; mt, mutant; ORR, objective response rate; PFS, progression-free survival; wt, wild type.

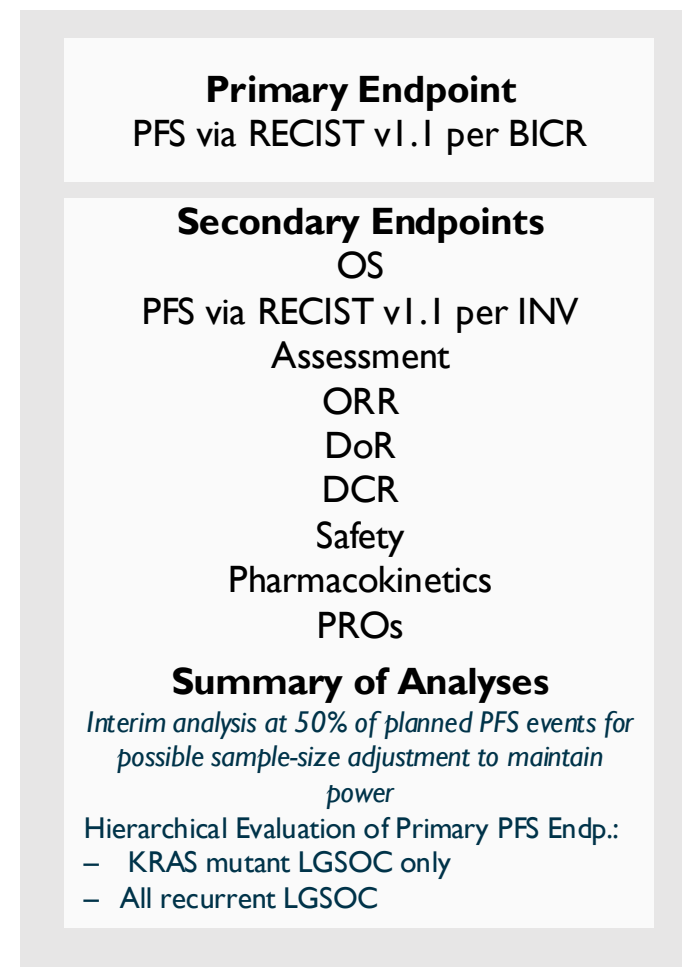
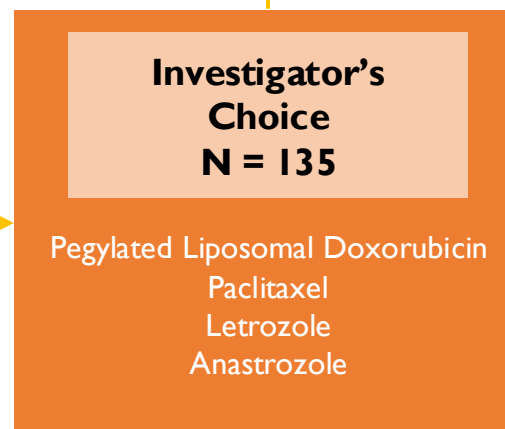
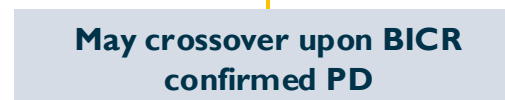
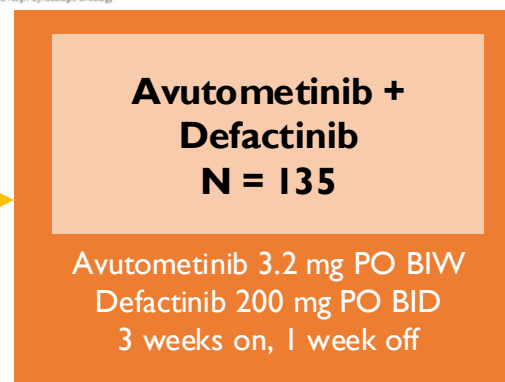
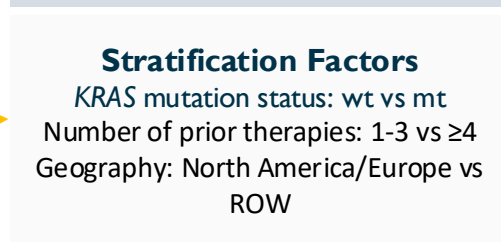
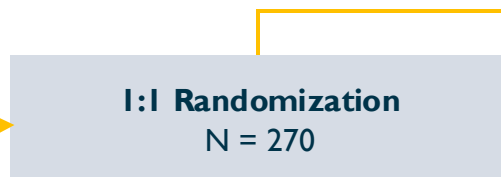
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# GOG-3097/ENGOT-ov81/NCRI/RAMP 301:

A Phase 3, Randomized, Open-Label Study of Combination Therapy with Avutometinib plus Defactinib Versus Investigator's Choice of Treatment in Patients with Recurrent Low-Grade Serous Ovarian Cancer (LGSOC)



NCT06072781



- Sparse PK samples to be collected only from patients randomized to the **avutometinib/defactinib** arm

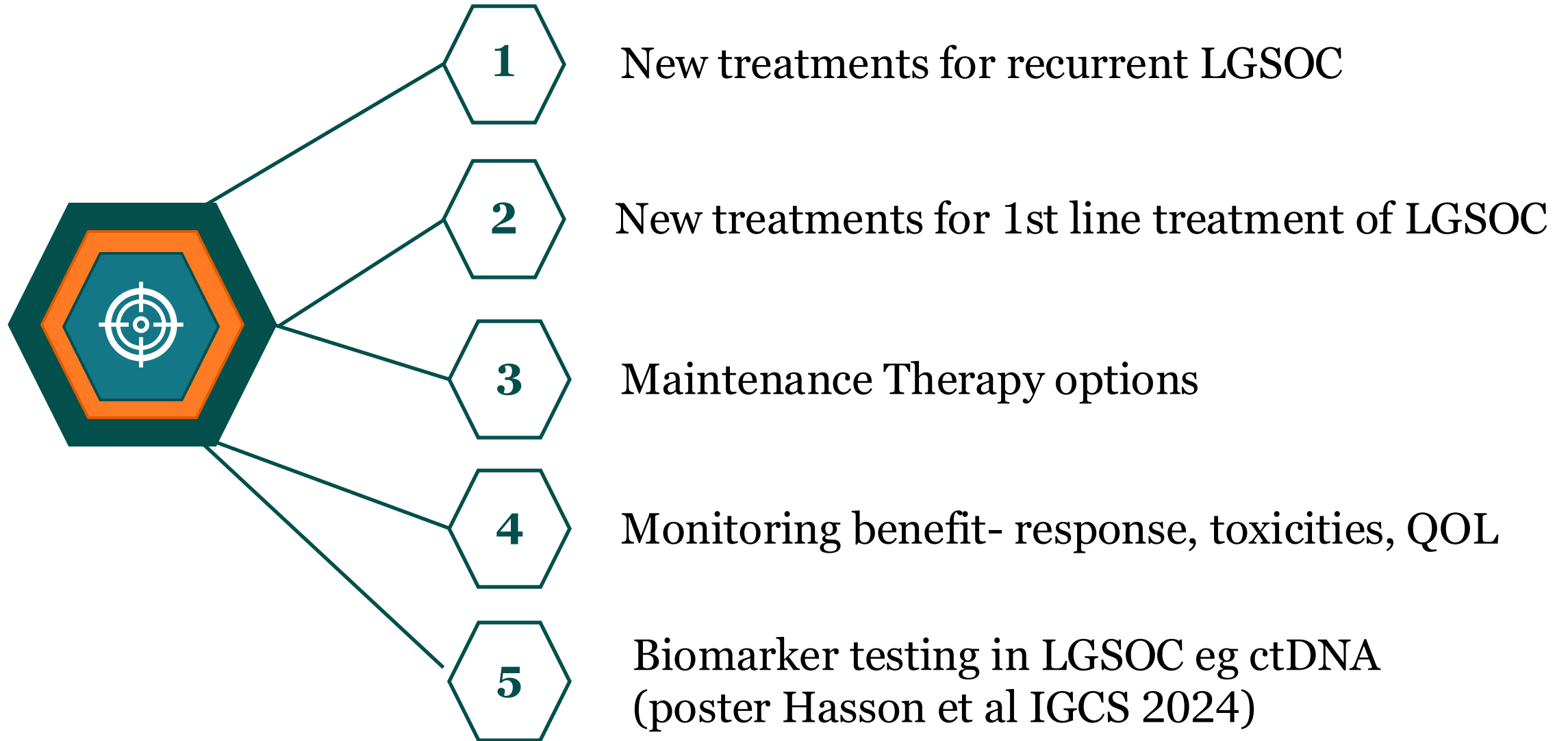
RECIST, response evaluation criteria in solid tumors; BICR, blinded independent central review; BID: twice a day; BIW: twice a week; DCR: disease control rate; DoR: duration of response; INV: investigator; mt: mutant; wt, wild type; PFS: progression free survival; ORR: objective response rate; OS: overall survival; PD: progressive disease; PROs: patient reported outcomes; ROW: rest of world

Avutometinib and defactinib are investigational drugs and have not been approved for use by any regulatory health authority. Safety and efficacy have not been established.

# Examples of Ongoing Studies in Recurrent LGSOC

Study	Phase	Therapy	Estimated primary completion
<b>RAMP301</b> (NCT06072781)	3	Avutometinib + defactinib vs Investigators choice SOC	
<b>ALEPRO*</b> (NCT05872204)	2	Abemaciclib + letrozole	Oct 2026
<b>NCT05113368</b>	2	Regorafenib + fulvestrant	Jun 2023
<b>PERCEPTION</b> (NCT04575961)	2	Pembrolizumab + chemotherapy	Nov 2023
<b>FUCHSia</b> (NCT03926936)	2	Fulvestrant	Apr 2022
<b>ComboMATCH*</b> (NCT05554367)	2	Palbociclib + binimetinib	Aug 2026
<b>ComboMATCH*</b> (NCT05554328)	2	Selumetinib + Olaparib	Oct 2028
<b>NCT04092270*</b>	1	Peposertib + chemotherapy	Sep 2023
<b>NCT04739800*</b>	2	Durvalumab + olaparib + cediranib	Dec 2023
<b>NCT02923934*</b>	2	Ipilimumab + nivolumab	Dec 2023
<b>NCT06494150</b>	2	Nab-sirolimus + fulvestrant	Aug 2027

# Future Directions



# Question and Answers

All Faculty



# Closing Comments

**Pedro T. Ramirez, MD, FACOG**

Houston Methodist Hospital  
Houston, Texas, USA



# Thank You

View this symposium as part of the IGCS on-demand program following the meeting.

