

Inaugural Southern California Genitourinary Cancer Research Forum

Key Updates in Prostate Cancer

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Disclosures

• Consultant for AstraZeneca, Bayer, Janssen, and Sanofi.

This presentation and/or comments will be free of any bias toward or promotion of the above referenced companies or their product(s) and/or other business interests.

This presentation and/or comments will provide a balanced, non-promotional, and evidence-based approach to all diagnostic, therapeutic and/or research related content.

This presentation has been peer-reviewed and no conflicts were noted.

The off-label/investigational use of Cabozantinib + Atezolizumab, AMG509, and ARV766 will be addressed.



Cultural Linguistic Competency (CLC) & Implicit Bias (IB)

STATE LAW:

The California legislature has passed <u>Assembly Bill (AB) 1195</u>, which states that as of July 1, 2006, all Category 1 CME activities that relate to patient care must include a cultural diversity/linguistics component. It has also passed <u>AB 241</u>, which states that as of January 1, 2022, all continuing education courses for a physician and surgeon **must** contain curriculum that includes specified instruction in the understanding of implicit bias in medical treatment.

The cultural and linguistic competency (CLC) and implicit bias (IB) definitions reiterate how patients' diverse backgrounds may impact their access to care.

EXEMPTION:

Business and Professions Code 2190.1 exempts activities which are dedicated solely to research or other issues that do not contain a direct patient care component.

The following CLC & IB components will be addressed in this presentation:

Importance of addressing bias and barriers to care based on socioeconomic status and differences in responses that have been noted based on race.

■ Patients who are underinsured can be treated with older generation drugs.

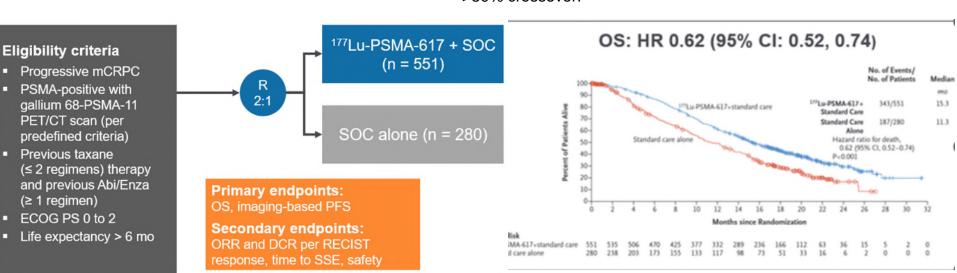


New frontiers in prostate cancer

- Antigen targeting therapy
 - Radioligand (177-Lu-PSMA-617)
 - Bispecific T cell engaging antibodies
 - Antibody-drug conjugates (ABBV 969)
- Combination immunotherapy
 - Cabozantinib + Atezolizumab (CONTACT 02)
- PARP inhibitors
- AR degraders
 - ARV 110, ARV 766 and beyond



VISION: 177-Lu-PSMA-617 radioligand therapy selection by PET "theranostic"



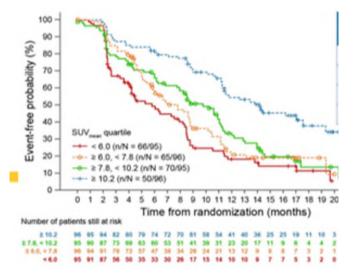
>80% crossover!

Sartor O, et al. N Engl J Med. 2021;385:1091-1103

PSMA-positive metastatic lesion

X City of Hope.

- PSMA-PET positivity defined as uptake ≥ liver
- No size criteria for PSMA-positive lesions
- No PSMA-negative visceral or lytic bone lesions ≥ 1 cm
- No PSMA-negative lymph node lesions ≥ 2.5 cm



VISION: side effect profile

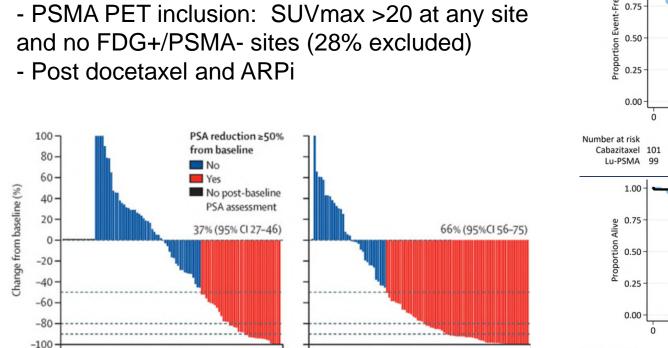
| | Safety Set (N = 734) | | | | | |
|---|--|------------------------|--|------------------------|--|--|
| TEAEs Occurring in ≥ 5% of Patients, No. (%) | All Grades | All Grades | | Grade 3-5 | | |
| | Lutetium 177-PSMA-617 + SOC (n = 529) | SOC Alone (n = 205) | Lutetium 177-PSMA-617 + SOC (n = 529) | SOC Alone (n = 205) | | |
| Fatigue | 228 (43.1) | 47 (22.9) | 31 (5.9) | 3 (1.5) | | |
| Dry mouth | 205 (38.8) | 1 (0.5) | 0 | 0 | | |
| Nausea | 187 (35.3) | 34 (16.6) | 7 (1.3) | 1 (0.5) | | |
| Anemia | 168 (31.8) | 27 (13.2) | 68 (12.9) | 10 (4.9) | | |
| Back pain | 124 (23.4) | 30 (14.6) | 17 (3.2) | 7 (3.4) | | |
| Arthralgia | 118 (22.3) | 26 (12.7) | 6 (1.1) | 1 (0.5) | | |
| Decreased appetite | 112 (21.2) | 30 (14.6) | 10 (1.9) | 1 (0.5) | | |
| Constipation | 107 (20.2) | 23 (11.2) | 6 (1.1) | 1 (0.5) | | |
| Diarrhea | 100 (18.9) | 6 (2.9) | 4 (0.8) | 1 (0.5) | | |
| Vomiting | 100 (18.9) | 13 (6.3) | 5 (0.9) | 1 (0.5) | | |
| Thrombocytopenia | 91 (17.2) | 9 (4.4) | 42 (7.9) | 2 (1) | | |
| Lymphopenia | 75 (14.2) | 8 (3.9) | 41 (7.8) | 1 (0.5) | | |
| Leukopenia | 66 (12.5) | 4 (2) | 13 (2.5) | 1 (0.5) | | |

Marrow reserve will dictate sequences and combinations

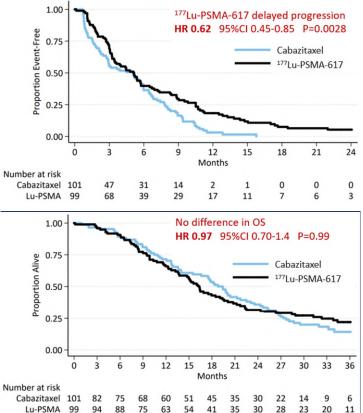




TheraP: phase II Lu177-PSMA vs Cabazitaxel



[177Lu]Lu-PSMA-617 (n=99)





Cabazitaxel (n=101)

Hofman MS, Lancet 2021; 27:797-801

Can we use177-Lu-PSMA-617 before chemotherapy?

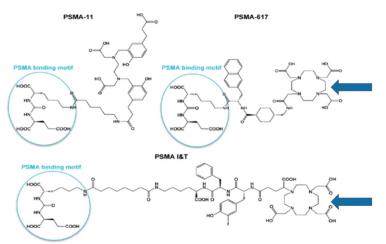
| PSMAf | Ore Sartor O, et | t al | | | |
|--|--|---|--|---|--------------------------|
| ESMO 2023 | | 3; LBA13 | Baseline Characteristics | ¹⁷⁷ Lu-PSMA-617 (n = 234) | ARPI Change (n = 234) |
| | | | Age, median (range), y | 71 (43-94) | 72 (53-91) |
| Eligibility criteria | PSMAfore (NCT04689828) is a multicenter, ope | en-label, randomized phase 3 trial | White, n | 211 | 214 |
| Progressive, mCRPC, taxane-naive in the metastatic setting and | Primary endpoints: rPFS according | ECOG 0 ECOG 1 | 146 86 | 115 114 | |
| have received 1 prior ARPI and are | Best supportive care is allowed in both arms. | to PCWG3-modified RES | Gleason score 8 to 10, n | 136 | 107 |
| candidates for a change 177Lu-PSMA-617 In ARPI 7.4 GBq IV ± 10% once every | Key secondary endpoint: OS Other secondary endpoints: rPFS2, PFS, PFS2, PSA50, time to | PSA, median (range), μg/L | 18.4 (0-1197) | 14.9 (0-4224) | |
| ≥ 1 PSMA-positive metastatic lesion on GA-PSMA-11 PET/CT | R 1:1 6 wk for 6 cycles (n = 234) | SSE, time to soft tissue progression, | Hemoglobin median, g/L | 128 | 129 |
| GA-PSMA-11 PETICT and no exclusionary PSMA-negative lesions Stratification factors: Prior ARPI use Pain symptomatology score | time to chemo, HRQoL, and safety and tolerability | Alkaline phosphatase, median IU/L | 100 | 100.3 | |
| | Participants with blinded independent centrally confirmed radiographic progression in the ARPI arm can cross over to the 177Lu-PSMA-617 arm. | Site of disease, n Liver Lymph node Bone | 13 76 205 | 7 74 203 | |
| | | | Prior ARPI, n Abiraterone Enzalutamide Other | 119 94 21 | 130 84 20 |

| median follow-up, 15.9 months) | (N=234) | (N=234) |
|--------------------------------|------------------------|-------------------|
| Cycles, median (range) | 6.0 (1-6) | - |
| rPFS ^a | | |
| Events, n (%) | 115 (49.1) | 168 (71.8) |
| Median (95% CI), months | 12.02 (9.30, 14.42) | 5.59 (4.17, 5.95) |
| HR (95% CI), p | 0.43 (0.33, 0.54), <0. | .0001 |
| | | |

OS not mature, but trending in opposite direction

Ongoing clinical trials with radioactive targeted therapy

| Name/NCT | Agents | Design (n) |
|-----------------------------|--|--|
| PSMAddition | ADT + ARPi +/- 177Lu-PSMA-617 | Randomized phase III, mHSPC |
| LUNAR NCT05496959 | SBRT +/- 177Lu-PNT2002 | Randomized phase II, oligomet prostate cancer |
| PRESERVE-006 NCT05682443 | ONC392 + 177Lu-PSMA-617 | Phase 1 mCRPC |
| PRINCE NCT03658447 | 177Lu-PSMA-617 + pembrolizumab | Phase 1b/II mCRPC |
| Mayo NCT06200103 | 177Lu-PSMA-617 de-escalation | Phase IV; stop after 5 vs 6 cycles |
| U W NCT06145633 | Vorinostat and 177Lu-PSMA-617 for the Treatment of PSMA-Low mCRPC | Phase II |
| UPLIFT NCT05113537 | Abemaciclib Before 177Lu-PSMA-617 for the Treatment of mCRPC | Phase I/II |



What's next:

Different particles (ex: Ac²²⁵, Pb, I¹³¹) Different PSMA binders Different protein targets (ex: hk2) ?Adaptive dosing Combinations, mHSPC

Bispecific T cell engaging antibodies for prostate cancer

- AMG 160: targets PSMA (1:1 with CD3)
 - phase 1 showed robust response rate but limited by antidrug antibodies
 - Toxicity limited ability to pursue phase 3
- AMG 509: targets STEAP1 (2:1 with CD3)
 - Dose escalation presented at ESMO 2023. better toxicity & efficacy
 - Likely going to phase 3
- JNJ-63898081: (PSMA 1:1 with CD3)
 - N=39, CRS in 65%, DLT transaminase elevation. 2 PSA 50, no objective response

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AMG160: adverse events

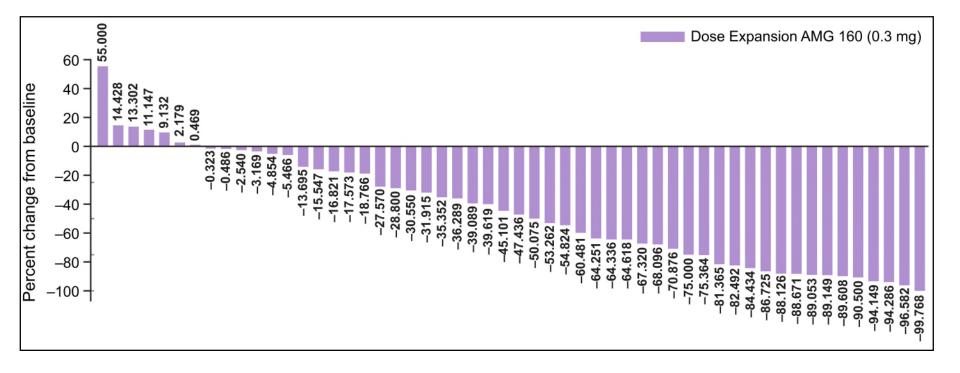
| | Dose expansion (N = 56) | | | |
|---|----------------------------|--------------------|--|--|
| TEAE | Any grade n (%) | Grade ≥ 3 n (%) | | |
| Cytokine release syndrome | 55 (98.2) | 9 (16.1)* | | |
| Anemia | 20 (35.7) | 11 (19.6) | | |
| Hypophosphatemia | 20 (35.7) | 9 (16.1) | | |
| Alanine aminotransferase increased | 12 (21.4) | 3 (5.4) | | |
| Aspartate aminotransferase increased | 11 (19.6) | 3 (5.4) | | |
| Platelet count decreased | 8 (14.3) | 3 (5.4)* | | |
| Hypertension | 4 (7.1) | 3 (5.4) | | |
| Neutropenia | 4 (7.1) | 4 (7.1)* | | |
| | | | | |

Dorff TB et al, Clin Cancer Res 2024

https://doi.org/10.1158/1078-0432.CCR-23-2978



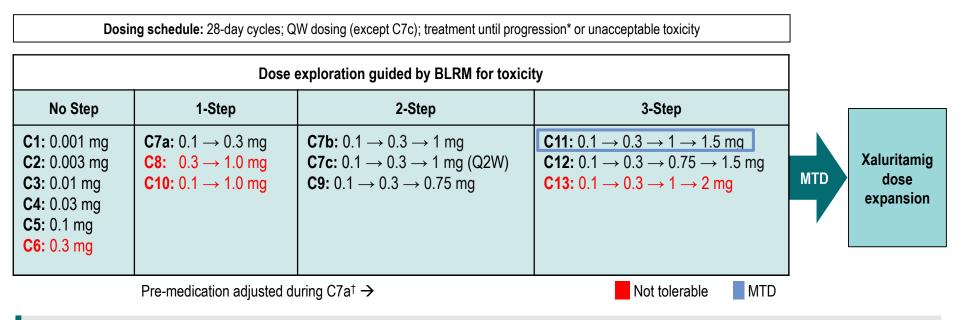
PSA response with AMG160 at full dose



Dorff TB et al, Clin Cancer Res 2024 https://doi.org/10.1158/1078-0432.CCR-23-2978



AMG509 phase 1 dose escalation (Kelly WK et al, ESMO 2023)



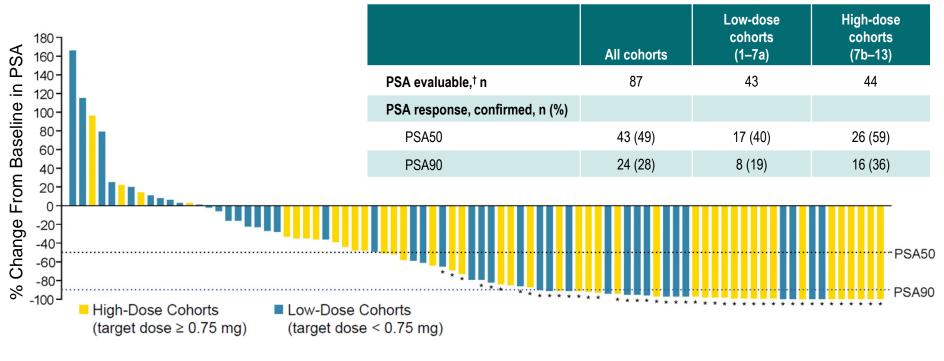
MTD was identified as 1.5 mg IV QW (3-step, D1 0.1 mg / D8 0.3 mg / D15 1.0 mg / D22+ 1.5 mg)

*Treatment beyond progression was allowed in patients deriving clinical benefit per PCWG3 criteria.

[†]Pre-medication post adjustment: steroids (2 doses) 6–12 hours and 1 hour pre-dose until target dose is reached; acetaminophen and IV hydration 1 hour prior for all doses in cycle 1. BLRM, Bayesian logistic regression model; C, cohort; D, day; IV, intravenous; MTD, maximum tolerated dose; PCWG3; Prostate Cancer Working Group 3; QW, weekly; Q2W, every 2 weeks.



Confirmed PSA responses were observed across cohorts



Xaluritamig (N = 87)

*Confirmed PSA responders of PSA50 or better.

[†]10 patients were not PSA evaluable: 6 patients were missing baseline PSA values, and 4 patients did not have sufficient follow-up duration. PSA, prostate-specific antigen.



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Antibody-drug conjugate (cytotoxic payload)

• PSMA ADC 2301 (Progenics) MMAE payload

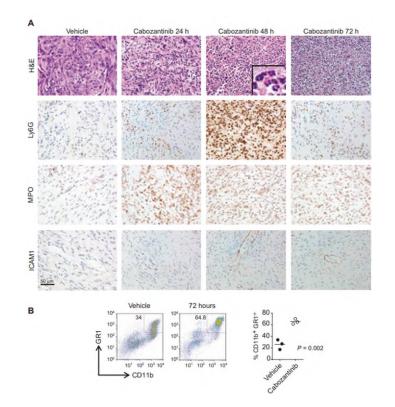
| Arm/Group Description | Prostate Specific Membrane Antigen Antibody Drug Conjugate (PSMA ADC) administered IV at 2.3 mg/kg Q3W for 8 cycles + <u>Show more</u> | Prostate Specific Membrane Antigen Antibody Drug Conjugate (PSMA ADC) administered IV at 2.3 mg/kg Q3W for 8 cycles + <u>Show more</u> |
|---|---|---|
| Overall Number of Participants Analyzed | 79 | 34 |
| >30% Decrease in PSA *Measure Type: Number Unit of Measure: % of responders | 29 | 32 |
| >50% Decrease in PSA * | 11 | 21 |

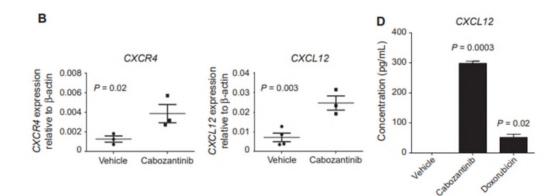
- ARX517 (NCT04662580) pAF-AS269 payload
 - recruiting at UCLA

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Clincaltrials.gov 2/21/24

Combination VEGF IO: coming to prostate?





Cabozantinib has been shown to induce favorable changes in tumor microenvironment and regression of prostate tumor in vivo

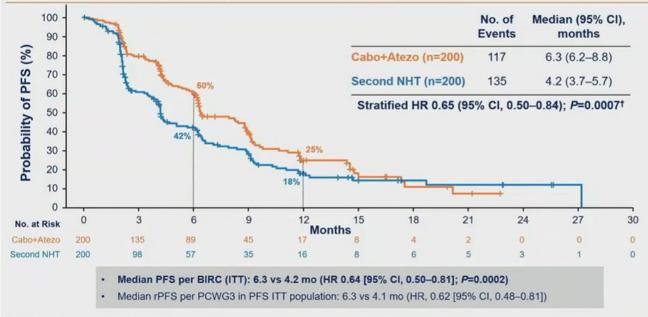
Patnaik A, et al. Cancer Discov 2017; 10.1158/2159-8290.CD-16-0778



Cabozantinib + atezolizumab: phase 3 CONTACT-02

PFS per BIRC* (PFS ITT Population[†])

Cabo+Atezo Reduced the Risk of Progression or Death by 35% vs Second NHT



Agarwal N et al GU ASCO 2024

mCRPC w/ measurable disease

OS not yet mature but trending in favor of cabo + atezo HR 0.79 (0.58-1.07)

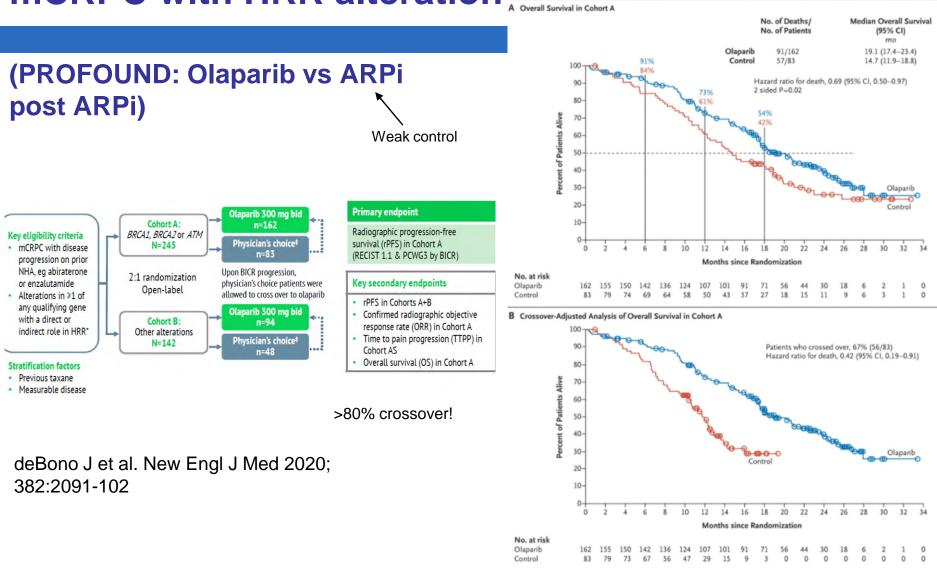
Weak control arm

CI, confidence interval; HR, hazard ratio. *PFS per RECIST v1.1 by BIRC or death. *Critical P value=0.002. *First 400 randomized patients. CONTACT-02 8

Agarwal N et al. ASCO GU 2024



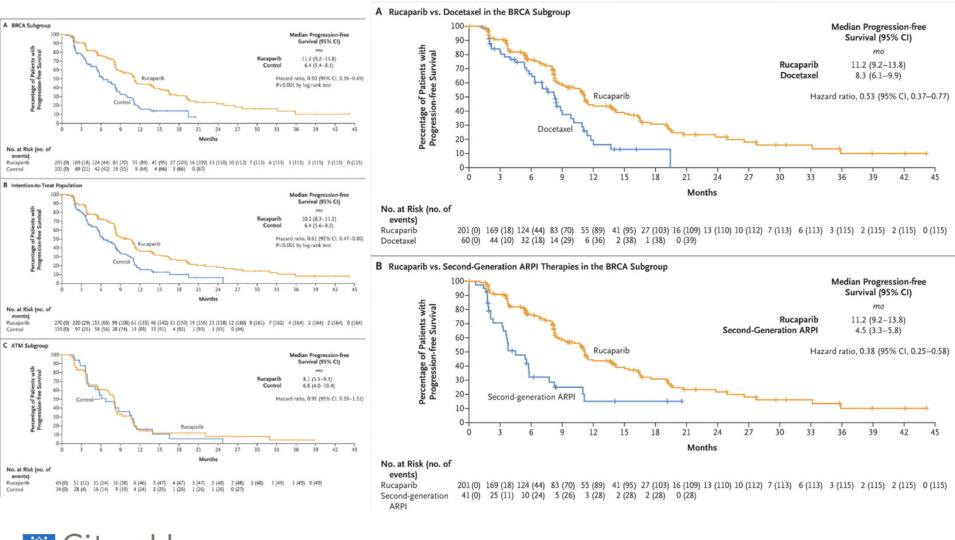
PARP inhibitor prolongs OS in mCRPC with HRR alteration



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Hussain M, et al. N Engl J Med. 2020;383(24):2345-2357

Rucaparib monotherapy: more effective than docetaxel for BRCA altered mCRPC (TRITON-3)



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Fizazi K et al. NEJM 2023; 388:719-32

Bone marrow toxicities are #1 cause of discontinuation

- Anemia
 - TALAPRO-1: 35% received ≥1 blood transfusion
 - PROfound: 21% grade 3+ anemia
 - TRITON2: 25.2% grade 3+ anemia, 28% ≥1 transfusion
- Leukopenia/infection
 - 8% grade 3 ANC talazoparib, 4% grade 3+ olaparib
- Pulmonary emboli
 - PROfound: 4% with olaparib vs 1% with abi/enza control;
 6% in TALAPRO-1
- Very few MDS seen

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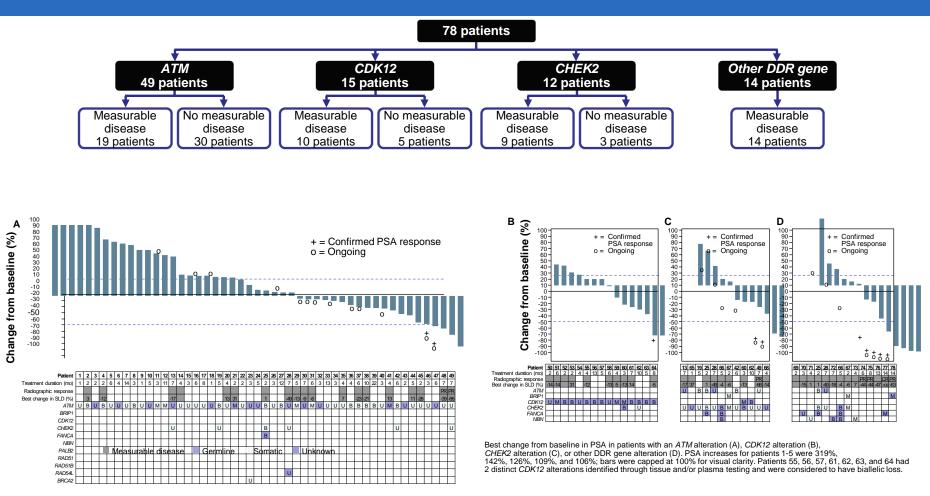
DeBono J, et al. N Engl J Med. 2020;382(22):2091-2102; Abida W, et al. J Clin Oncol. 2020;38:3763-3772; DeBono J, et al. Lancet Oncol. 2021;22:1250-1264

PARP: unanswered questions and what's next

- How well does PARPi work in HRR+ aside from BRCA?
- Does it work in molecularly unselected patients with prostate cancer, when combined with ARPi?
- Financial implications and barriers
- Moving to mHSPC (for BRCA+ and ?others)
- Combining with radioligand therapy



TRITON2: Rucaparib in mCRPC non-BRCA DDR gene alterations



ATM, ataxia telangiectasia mutated; BRCA (2), breast cancer type (2) susceptibility protein CR, complete response; DDR, DNA damage repair; mCRPC, metastatic castration resistant prostate cancer; mo, month; PR, partial response; PSA, prostate specific antigen; SLD, sum of the longest diameter

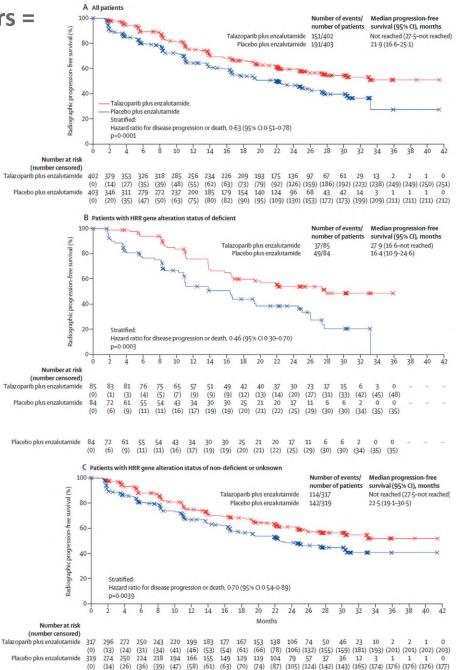
Abida W, et al. Clin Cancer Res. 2020;26:2487-2496

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TALAPRO-2: Talazoparib + enzalutamide 1st line mCRPC vs placebo + enzalutamide (all comers = unselected for HRR alteration)

Agarwal N et al. Lancet 2023; 402:22-28

| Baseline serum PSA, μg/L | 18-2 (6-9-59-4) | 16-2 (6-4-53-4) |
|--|--------------------------|-----------------|
| Baseline circulating tumour cell count, cells per 7·5 mL of blood | 1(0-7) | 1 (0-6) |
| Gleason score† | | |
| <8 | 117 (29%) | 113 (28%) |
| ≥8 | 281 (70%) | 283 (70%) |
| Disease site | | |
| Bone (including with soft tissue component) | 349 (87%) | 342 (85%) |
| Lymph node | 147 (37%) | 167 (41%) |
| Visceral (lung) | 45 (11%) | 61 (15%) |
| Visceral (liver) | 12 (3%) | 16 (4%) |
| Other soft tissue | 37 (9%) | 33 (8%) |
| ECOG performance status | | |
| 0 | 259 (64%) | 271 (67%) |
| 1 | 143 (36%) | 132 (33%) |
| Previous taxane-based chemotherapy§ | 86 (21%) | 93 (23%) |
| Previous treatment with novel hormonal therapy | 23 (6%) | 27 (7%) |
| Abiraterone | 21 (5%) | 25 (6%) |
| Orteronel | 2 (<1%) | 2 (<1%) |
| HRR gene alteration status by randomisa | tion stratification | |
| Deficient | 85 (21%) | 84 (21%) |
| Non-deficient or unknown | 317 (79%) | 319 (79%) |
| HRR gene alteration status by prospectiv | e tumour tissue testing¶ | |
| Deficient | 85 (21%) | 82 (20%) |
| Non-deficient | 207 (51%) | 219 (54%) |
| Unknown | 110 (27%) | 102 (25%) |
| BRCA1/2 alteration | 27 (7%) | 32 (8%) |
| | | |



TALAPRO-2: primary endpoint by BRCA/HRR status

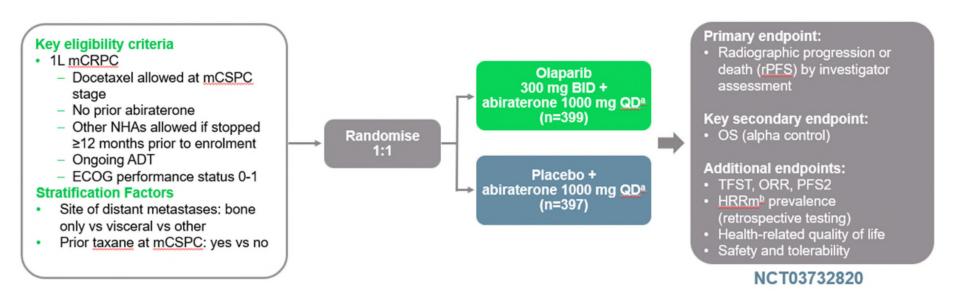
B By BRCA1/2 status, HRR gene alteration status, and prospective tumour tissue testing

BRCA1/2-altered, HRR-deficient 8/27 22/32 0.23 (0.10-0.53) 0.0002 -Non-BRCA1/2-altered, HRR-deficient 29/58 27/52 0.66 (0.39-1.12) 0.12 Non-BRCA1/2-altered or unknown, intention-to-treat 143/375 169/371 0.69 (0.55-0.86) 0.0011 By prospective tumour tissue testing **HRR-deficient** 36/83 47/80 0.45 (0.29-0.69) 0.0002 HRR-non-deficient 70/198 96/214 0.66 (0.49-0.91) 0.0092 HRR-unknown 45/121 48/109 0.79 (0.52-1.18) 0.25 151/402 191/403 0.63 (0.51-0.78) Overall <0.0001 0.25 0.50 1.00 1.25 Favours talazoparib plus enzalutamide Favours placebo plus enzalutamide

 BRCA alteration is still important biomarker to select those who benefit MOST



PROPEL trial: abiraterone +/- Olaparib in UNSELECTED mCRPC

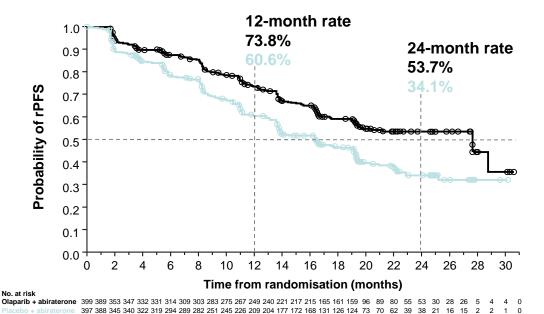


| | abi + olap | abi + placebo |
|-------------|-------------|----------------|
| | n= 399 | <u>n = 397</u> |
| HRRm | 111 (27.8%) | 115 (29%) |
| HRR non-mut | 279 (69.9%) | 273 (68.8%) |



PROpel: rPFS by blinded independent central review^a

39% RISK REDUCTION OF PROGRESSION OR DEATH WITH OLAPARIB + ABIRATERONE. HIGHLY CONSISTENT WITH THE PRIMARY ANALYSIS



| | Olaparib + abiraterone (n=399) | Placebo + abiraterone (n=397) |
|-------------------------|--------------------------------------|-------------------------------------|
| Events, n (%) | 157 (39.3) | 218 (54.9) |
| Median rPFS (months) | 27.6 | 16.4 |

OS trending in favor of combination, not yet statistically significant

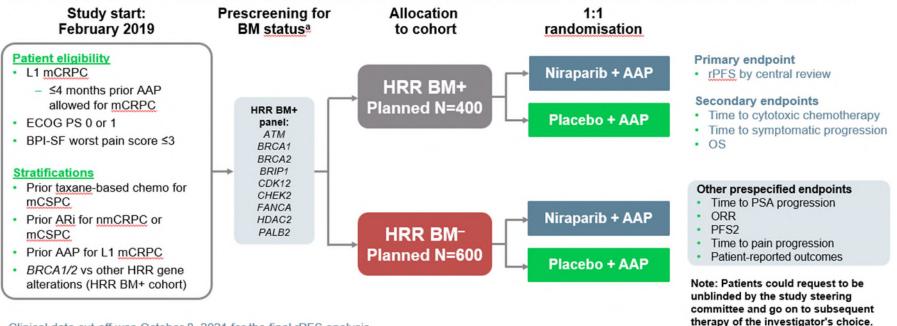
CI, confidence interval; HR, hazard ratio; rPFS, radiographic progression-free survival Saad F, et al. J Clin Oncol. 2022; 40 (suppl 6; abstr 11)

^aPredefined sensitivity analysis. ^bNominal. ^cIn combination with prednisone or prednisolone



MAGNITUDE trial

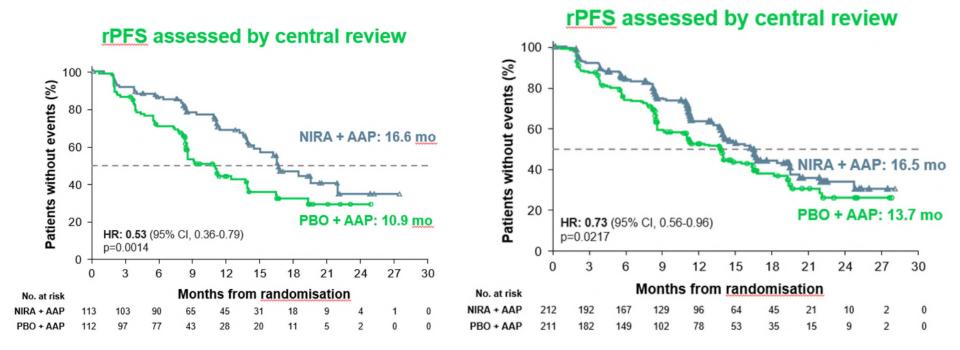
PROSPECTIVELY SELECTED BIOMARKER COHORTS DESIGNED TO TEST HRR BM+ AND HRR BM-



Clinical data cut-off was October 8, 2021 for the final rPFS analysis.



MAGNITUDE primary endpoint results



BRCA mutated

all HRR+



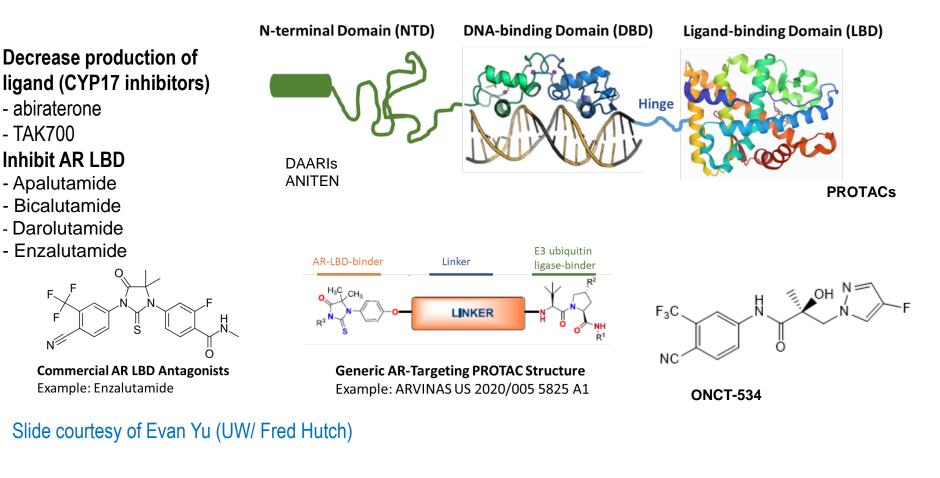
Prespecified futility analysis in **biomarker HRR- group** after ~200 enrolled (125 progression events) showed NO BENEFIT therefore this group stopped enrolling.

What's next for PARP: mHSPC and novel combinations

| Name/Sponsor | PARPi | Combination | Design (n) |
|------------------|-------------|------------------------------|-------------------------------------|
| AMPLITUDE | Niraparib | Abiraterone | Randomized mHSPC, HRR+ (788) |
| TALAPRO-3 | Talazoparib | Enzalutamide | Randomized mHSPC, HRR+ (550) |
| City of Hope PCF | Talazoparib | Abiraterone | Single arm mHSPC, Unselected (70) |
| NCT03076203 | Niraparib | Radium-223 | mCRPC prior abi/enza (chemo OK) |
| NCT03874884 | Olaparib | 177-Lu-PSMA-617 | PSMA PET + mCRPC |
| NCT04253262 | Rucaparib | Copanalisib | mCRPC, prior abi/enza. NEPC allowed |
| NCT04592237 | Niraparib | Cabazi, Carbo, Cetrelimab | AVPC |
| NCT04846478 | Talazoparib | Tazemetostat | Post ab/enza, post doce |
| NCT04336943 | Olaparib | Durvalumab | BCR w/ high neoantigen load |



Overview of AR Targeting Modalities



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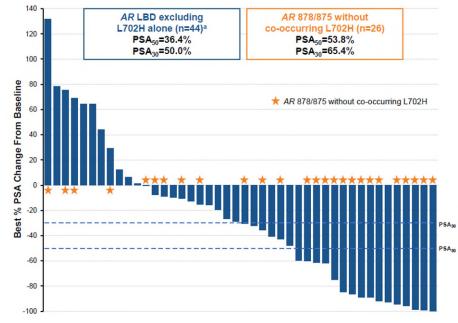
ARV-110

aka bavdegalutamide

- In phase 1, patients with mCRPC received bavdegalutamide 35–700 mg QD or 210–420 mg twice daily
- In phase 2 (ARDENT), patients with mCRPC were assigned to subgroups based on AR mutation status or a clinically defined subgroup (patients who had 1 prior NHA and no prior chemotherapy) and received bavdegalutamide 420 mg QD

Key eligibility criteria

- Confirmed mCRPC and disease progression on last line of treatment
 - Phase 1 dose escalation: Disease progression on ≥2 prior lines of systemic therapy, including abiraterone or enzalutamide
 - Phase 2 cohort expansion (ARDENT): 1–2 prior NHAs with ≤1 prior chemotherapy regimen each for castration-sensitive PC and CRPC



ESMO 2023 (Petrylak DP)

Phase 1/2 subset study results (AR LBD mutation excluding L702H alone)



ARV-110

| | Table 2: TRAEs reported in ≥10% of patients treated with bavdegalutamide 420 mg QD in the phase 1/2 study (N=153) | | | | |
|---|---|----------|---------|---------|---------|
| Adverse Events | n (%) | Total | Grade 1 | Grade 2 | Grade 3 |
| ESMO 2023 (Petrylak DP) Phase 1/2 subset study results (AR LBD mutation + excluding L702H alone) | Any TRAE | 135 (88) | 45 (29) | 66 (43) | 24 (16) |
| | Nausea | 85 (56) | 59 (39) | 24 (16) | 2 (1) |
| | Fatigue | 53 (35) | 36 (24) | 16 (10) | 1 (1) |
| | Vomiting | 50 (33) | 38 (25) | 11 (7) | 1 (1) |
| | Decreased appetite | 39 (25) | 21 (14) | 18 (12) | 0 |
| | Diarrhea | 37 (24) | 27 (18) | 7 (5) | 3 (2) |
| | Alopecia | 28 (18) | 24 (16) | 4 (3) | NA |
| | Anemia | 23 (15) | 10 (7) | 6 (4) | 7 (5) |
| | Decreased weight | 19 (12) | 10 (7) | 9 (6) | 0 |
| | Increased AST | 18 (12) | 13 (8) | 4 (3) | 1 (1) |



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Conclusions: updates for advanced prostate cancer

- Radioligand therapy prolongs OS, good toxicity profile
 - New agents may increase benefit (particle, binder, target)
- Other ways to target Prostate antigens are in trials
 - Immunotherapy (bispecific/CAR T), ADC cytotoxic
- Combination of VEGF TKI + IO may become an option
 Cabozantinib + atezolizumab (CONTACT-02)
- PARP inhibitors are powerful in some mCRPC
 - Even w/new data: germline+ somatic testing are important!
- AR PROTAC degraders (and other novel AR targeting strategies) may be another advance
 - ARV-766 trial open at COH

🛣 Cityof Hope。