How to present Scientific Research

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The academic core of Atrium Health

Learning Objectives

- Crafting a concise and engaging narrative that effectively communicates the significance of their research to a diverse audience.
- Developing effective visual aids, whether it be slides or posters, to complement their oral presentations and enhance audience comprehension.
- Practicing effective delivery techniques, including vocal modulation, body language, and eye contact, to maintain audience engagement and convey confidence.
- Navigating Q&A sessions with poise and professionalism, addressing questions articulately and demonstrating a thorough understanding of their research.

What do you want to take away from this session?

Nobody has responded yet.

Hang tight! Responses are coming in.

This session is designed to help you:

- You are required to submit your research in the form of a scientific abstract. You will have a 5-minute lightning talk followed by a 2-minute Q&A session, using PowerPoint presentations.

- Additionally, a majority of you will also submit your abstracts to annual BMES conference, where you have the opportunity to present you summer research as a poster presentation.

Research Abstract

Basic Structure

Table 1. Elements of a research abstract's structure and the content expectations of each structural element.

Structural element	Content Expectations
Title	• Include key terms of the research topic • A brief summary of content that arouses interest
Introduction	• Description of what is already known about the topic in question (i.e. a very brief overview of important literature on the topic) • Identification of a gap in the literature that requires filling (e.g. that there is a need for not-yet-conducted research / innovation to address the gap). • Statement of a research question that will address the gap.
Methods	• Description of how the study was conducted. • Explanation of how the methods used in the study provided data that answers the research question. • Report of data collection and data analysis methods.
Results	• Description of the essential data that answer the research question.
Conclusion	• Statement of the answer to the research question. • Discussion of findings in relation to the research question and to the debates going on in the field. • Report of a succinct take-home message (increasingly, these messages are related to translating findings into practice).

Availability of cookies during an academic course session affects evaluation of teaching

Michael Hessler,† Daniel M Pöpping,† Hanna Hollstein, Hendrik Ohlenburg, Philip H Arnemann, Christina Massoth, Laura M Seidel, Alexander Zarbock & Manuel Wenk

OBJECTIVES Results from end-of-course student evaluations of teaching (SETs) are taken seriously by faculties and form part of a decision base for the recruitment of academic staff, the distribution of funds and changes to curricula. However, there is some doubt as to whether these evaluation instruments accurately measure the quality of course content, teaching and knowledge transfer. We investigated whether the provision of chocolate cookies as a content-unrelated intervention influences SET results.

METHODS We performed a randomised controlled trial in the setting of a curricular emergency medicine course. Participants were 118 third-year medical students. Participants were randomly allocated into 20 groups, 10 of which had free access to 500 g of chocolate cookies during an emergency medicine course session (cookie group) and 10 of which did not (control group). All groups were taught by the same teachers. Educational content and course material were the same for both groups. After the course, all students were asked to complete a 38-question evaluation form.

RESULTS A total of 112 students completed the evaluation form. The cookie group evaluated teachers significantly better than the control group (113.4 ± 4.9 versus 109.2 ± 7.3; p = 0.001, effect size 0.68). Course material was considered better (10.1 ± 2.3 versus 8.4 ± 2.8; p = 0.001, effect size 0.66) and summation scores evaluating the course overall were significantly higher (224.5 ± 12.5 versus 217.2 ± 16.1; p = 0.008, effect size 0.51) in the cookie group.

CONCLUSIONS The provision of chocolate cookies had a significant effect on course evaluation. These findings question the validity of SETs and their use in making widespread decisions within a faculty.

Lara Varpio, Jonathan Amiel & Boyd F. Richards (2016) Writing competitive research conference abstracts: AMEE Guide no. 108, Medical Teacher, 38:9, 863-871, DOI: 10.1080/0142159X.2016.1211258

Review process

- It will be peer reviewed by 2-3 people.
- They probably only spend 2-3 minutes on your abstract.
- They are asked to rate your abstract on the following 3 aspects:
  - Clarity
  - Quality
  - Relevance

	Low Quality =1	2	Needs Improvement =3	4	Outstanding=5
BACKGROUND - Does the introduction build a logical case? - Is the context or conceptual framework provided for the problem statement? - Is the research question clear and hypothesis, where applicable, stated?	☐ The subject and purpose are not obvious.	☐	☐ Author describes the main subject and purpose of the research/project and indicates why the research/project is important.	☐	☐ Author describes the main subject and purpose of the research/project and indicates why the research/project is important and places the research/project in a larger topical context.
OBJECTIVES	☐ No stated objective	☐	☐ Stated objective sufficiently developed	☐	☐ Clearly stated and well thought out study objective
METHODS - Is the study design clearly described? - Are sampling procedures adequately described, including inclusion and exclusion criteria; is there potential selection bias? - Are the measures reliable and valid? - Are possible confounding factors addressed? - Are the qualitative or quantitative analyses to determine outcomes/impact identified and appropriate for answering the intended purpose of the study?	☐ Chosen study design poorly executed with critical flaws that risk endangering the validity arguments of the results/findings.	☐	☐ Chosen study design is executed with one or more minor flaws that could threaten the validity arguments or the results/findings.	☐	☐ Chosen study design executed in an acceptable manner in which results/findings are expected to support validity evidence.
RESULTS - Do the results align with the methods and study questions? - Is the amount of data presented sufficient, balanced, accurate, and supportive of inferences or themes? - Are the statistics reported correctly and appropriately?	☐ Data critical to interpretation of the study is absent.	☐	☐ Data critical to interpretation of the study is either not clearly presented or may be incomplete.	☐	☐ Data critical to interpretation of the study is clearly AND completely presented.
CONCLUSIONS - Are conclusions clearly stated and justified by the data? - Do the conclusions follow from the design, methods, and results? - Are study limitation mentioned?	☐ Conclusions are not supported by the results of the study.	☐	☐ Conclusions are sometimes supported by the results of the study.	☐	☐ Conclusions fully supported by the results of the study.
IMPACT - Are implications strong enough to influence how clinicians/teachers/ researchers "act" in education, clinical practice, or future research? (i.e. Changes in behavior in the workplace)	☐ Implications of the findings for clinical practice, research, education, or policy not stated.	☐	☐ Implications of the findings are incomplete; this work could change clinical practice, research, education, or policy	☐	☐ Implications of the findings are clearly stated; this work is highly likely to change clinical practice, research, education, or policy
LANGUAGE - Is the writing clear and organized to effectively communicate findings?	☐ The abstract is wordy and nonspecific	☐	☐ The author uses concise language and cites specific details	☐	☐ The author uses concise language and cites specific details and makes no errors in language use or conventions, all acronyms are defined when first used.

Dos and don'ts

Dos	don'ts
• Know the purpose of the conference and the track (the relevance check) • Always state the research gap • Present the statistically significant result if available • Method section is the key section to show you credibility. So this section can be a bit longer than other sections when comparing with a formal research paper submitted to a journal • Use transition words	• If you think reviewer will be confused, do not include, no matter how interesting/significant you think the results are. • Forget to connect the result with the research gap

Use transition words

Table 3. Transition words and phrases explained and examples provided

TRANSITION TO BE CREATED	EXAMPLES OF TRANSITION WORDS AND PHRASES TO USE
To show that the sentence builds on or adds onto the content of the previous sentence	Also; Furthermore; Moreover; In addition
To show that the sentence is part of a sequence of events, or arguments	Next; Then; First; Second; Third.
To show that the sentence is an illustration or example of the content of the previous sentence	For instance; Consider this example; Specifically
To show that the sentence stands in a cause-and-effect relationship with the content of the previous sentence	Accordingly; Thus; Since; Consequently
To show that the sentence stands in contrast to the content of the previous sentence	Although; However, Conversely
To show that the sentence is a concluding statement	Therefore; In sum; In short

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Abstract 1

What is your score? - Abstract 1

A. 30 and above

0%

B. 25-29

0%

C. 20-24

0%

D. Below 20

0%

What can be improved? - Abstract 2

Nobody has responded yet.

Hang tight! Responses are coming in.

Reviewer Score and comments – 23.5/35

BACKGROUND	OBJECTIVES	METHODS	RESULTS	CONCLUSIONS	IMPACT	LANGUAGE
4	3	3	3	3	4	4
3	3	3	3	3	3	4

Comments for author(s):	**Comments to organizers:**
Did RIG attract faculty/mentors. Who is guiding/leading/facilitating the group. Due to factors such as timing of conferences, deadlines for abstracts, it might be helpful if data from October 1st 2021-Sep 30 2021 is compared to Oct 1st 2022 - Sep 30 2022.	RIG seems to be an excellent concept to engage residents and students in research - scholarly activities, critical appraisal and promote implementation of evidence of based medicine
Background could be strengthened by reiterating the importance of psychiatric research (not just that understanding research is important for training). clearly outline your objectives on how they remediate the barriers mentioned in the background. How are you assessing "support sought" - this is not mentioned in the results section.	accept only with significant revisions

Abstract 2

What is your score? - abstract 2

A. 30 and above

0%

B. 25-29

0%

C. 20-24

0%

D. below 20

0%

What can be improved? - abstract 2

Nobody has responded yet.

Hang tight! Responses are coming in.

Reviewer Score and comments – 30.5/35

BACKGROUND	OBJECTIVES	METHODS	RESULTS	CONCLUSIONS	IMPACT	LANGUAGE
4	5	5	5	4	5	5
4	4	4	4	4	4	4

Comments for author(s):	**Comments to organizers:**
The abstract was clear and walked the reviewer through the process. A few more comments or examples might help introduction. Goal/hypothesis well described. Explanation of methods was adequate and may be improved explaining what might be taught/shown by teacher (is there a standard process used by all?). What statistics were used and what level of significance was sought? Non-parametric test and what $p< 0.05$? Conclusion liked results but could be enhanced with emphasis on things that appear to have been done like 1:1 education seemed very effective.	I liked the presentation. They have done good work and might be considered for an award. I think they would benefit from sharing their process more as others may benefit from what they have done to use them as model of teaching .
Thank you for submitting and for the opportunity to review. I recommend reviewing the submission for typos and spelling errors. There were a few that appeared, perhaps autogenerated. - (ie perform instead of preform;) - Within the methods section, it would be wise to include an image or outline of an appropriate foot/ankle exam, critical elements required. Would also like to see tables included to demonstrate data on final poster	

Poster

Basic Format

"Abx 101": a successful first foray into empiric antibiotics

Wake Forest School of Medicine

Katherine R. Schafer MD[1], E Shen PhD[2], Kacy Ramirez MD[3], Timothy R. Peters MD[3].
1 Section on Infectious Diseases; 2 Wake Forest University School of Medicine; 3 Section on Pediatric Infectious Diseases

BACKGROUND & OBJECTIVES

Understanding core principles of empiric antibiotic therapy is essential for antimicrobial stewardship. Pre-pandemic, the "Abx 101" workshop taught students an initial approach to empiric antibiotics.

Objectives: (1) Construct a systematic approach to empiric antibiotics, (2) List normal flora/likely bacterial pathogens for anatomic location of disease, (3) Categorize antibiotics by their coverage, (4) Apply microbiology and antibiotic knowledge to cases.

METHODS

- Originally delivered as a 2 hour workshop with 50 students (n=2 in November 2019, March 2020)
- Adapted to 1 hour session (virtual, in-person, and hybrid) with 25 students and 1 faculty facilitator without breakout groups. Content was unchanged other than fewer cases

Introduction
- Presentation of general approach to empiric antibiotics
- Faculty-facilitated interactive microbiology review of typical anatomic microbiota (or likely pathogens)

Antibiotic coverage
- Workshop version: students divided into small groups and were assigned a category of antibiotic coverage (e.g. "MRSA drugs"). Jigsaw technique was used for small group teach back to the class
- 1 hour didactic version: individual students were called on to allocate drugs from the list into a given category of antibiotic coverage

Bug-Drug Pairings
- Faculty facilitated a discussion in which students matched initial antibacterial therapy for each body area's typical pathogens (Figure 4).

Case discussions
- Workshop version: Small groups were assigned a case in which they identified likely diagnosis, most likely pathogens, and appropriate empiric antibiotics to target those organisms, then presented back to the class (Figures 5 & 6)
- 1 hour didactic version: individual students volunteered to lead discussion of cases with the class

Worksheet completion

Figure 1

Figure 2

Figure 3

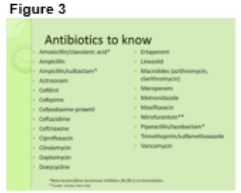


Figure 4

Figure 5

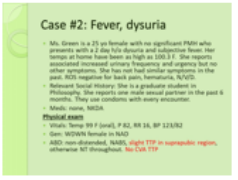
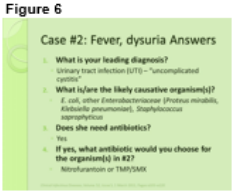


Figure 6



RESULTS

- 30 of 164 (18%) students completed the survey (n=17 from in-person, n=13 virtual).
- 100% of respondents deemed the format appropriate for the content.
- 100% of respondents rated the session as extremely/quite relevant.
- "Interaction" was the most common theme in qualitative analysis
- Representative comments for most effective elements of the activity:

"…the interactiveness with the students"

"…engaging group/team components."

"Group activity kept us engaged!"

DISCUSSION

- "Abx 101" was acceptable relevant, and formatted well for learning about empiric antibiotics
- The curriculum's interactive nature adapts well for in-person and remote learning.
- Although the response rate to the survey was low, the Centre for Higher Education Quality suggests that a response rate of >10% is still valid

NEXT STEPS

- Develop pre- and post-test to measure student learning from the session

Considerations

This is a basically a visual presentation of your research abstract. In your poster:

- Guess what audience will look at first when they walk by?
- You can stand by your poster and ask and answer questions! – Be bold, make the strongest statement as long your data supports that
- It is open to all attendee in the conference, not just the reviewers. - May need to adjust your jargons a bit.
- A picture (graph) is worth a thousand words – and you can explain
- You can use colors now!

Steps

- Find your organization/school's poster template
- Determine what to include
- Build the narrative of your research – tell your story!
- Practice! Practice! Practice!

- Smile!
- ARCS (Attention; Relevance, Confidence, Satisfactory)
- "Should I go into more details about …"
- Maybe give audience a handout (your project title, take home message, your contact info)

O⁶-Benzylguanine Inhibits Tamoxifen Resistant Breast Cancer Cell Growth and Resensitizes Breast Cancer Cells to Anti-Estrogen Therapy

Joshua Smith[1], George C Bobustuc[1], Rafael Madero-Visbal[1], Jimmie Colon[1], Beth Isley[1], Jonathan Ticku[1], Kalkunte S. Srivenugopal and Santhi Konduri[1]

[1]Cancer Research Institute of M.D Anderson Cancer Center Orlando [2]Texas Tech University Health Sciences Center, Amarillo, TX

Abstract

Endocrine therapies using anti-estrogens are least toxic and very effective for breast cancers, however, tumor resistance to tamoxifen remains a stumbling block for successful therapy. Based on our recent study on the involvement of the DNA repair protein MGMT in pancreatic cancer (Clin Cancer Res. 15, 6087, 2009), here, we investigated whether MGMT overexpression mediates tamoxifen resistance. Specifically, we determined whether administration of MGMT inhibitor [O⁶-benzylguanine (BG)] at a non-toxic dose alone or in combination with the anti-estrogens (tamoxifen/fulvestrant) curtails human tamoxifen resistant breast cancer cell growth. Further, we also determined whether BG sensitizes breast cancers to tamoxifen using tamoxifen resistant cells.

MGMT expression was found to be increased in breast cancer cells relative to normal breast epithelial cells. Also, MGMT levels were significantly higher in tamoxifen resistant MCF-7 compared to the parent cells. Silencing of the ER-α expression using a specific siRNA resulted in augmentation of MGMT mRNA and protein levels by 2 fold. We also observed an inverse correlation between MGMT and p53 levels in breast cancer cell lines; moreover, p53 downregulation was accompanied by increased MGMT expression. Other experiments showed that BG alone or BG in combination with tamoxifen or fulvestrant decreased ER-α expression, whereas tamoxifen alone and fulvestrant alone increased and decreased the same respectively. However, all these treatments increased the $p21^{Waf1}$ mRNA and protein expression significantly. BG inhibited tamoxifen resistant breast cancer growth in a dose-dependent manner and it also resensitized resistant breast cancer cells to anti-estrogen therapy (TAM/ICI). These combinations also enhanced the cytochrome C release and the PARP cleavage, indicative of apoptosis. In breast cancer xenografts, BG alone or a combination of BG with tamoxifen or fulvestrant caused significant tumor growth delay and immunohistochemistry revealed that BG inhibited the expression of MGMT, ER- α, ki-67 and increased $p21^{Waf}$ staining. These findings suggest that MGMT inhibition may provide a novel and effective approach for overcoming tamoxifen resistance.

Introduction

Recent advances in breast cancer research have identified key pathways involved in the repair of DNA damage induced by chemotherapeutic agents. The ability of cancer cells to recognize DNA damage and initiate DNA repair is an important mechanism for therapeutic resistance and has a negative impact on therapeutic efficacy. A number of DNA-damaging alkylating agents attack the nucleophilic O^6 position on guanine, forming mutagenic and highly cytotoxic interstrand DNA crosslinks. The DNA repair enzyme O^6-alkylguanine DNA alkyltransferase (AGT), encoded by the gene MGMT, repairs alkylation at this site and is responsible for protecting both tumor and normal cells from alkylating agents. MGMT is expressed constitutively in normal cells and tissues. In breast tumors, MGMT gene expression is elevated and levels are up to 4-fold higher than in the normal breast. Interestingly, it has been shown that tamoxifen accelerates proteasomal degradation of MGMT in human cancer cells. In 1991, Pegg, Moschel, and Dolan observed that O^6 benzylguanine (BG) inhibited AGT and potentiated the cytotoxicity of both chloroethylating agents and methylating agents. In a series of important observations, they fully characterized the interaction between BG and AGT and its therapeutic impact. They showed that BG binds AGT, transferring the benzyl moiety to the active site cysteine (Fig. 1). The reaction is very rapid and more potent than any other previously known AGT inhibitor. BG is not incorporated into DNA in living cells and reacts directly with both cytoplasmic and nuclear AGT. Because BG is a pseudosubstrate for MGMT which results in the covalent transfer of benzyl group to the active site cysteine, the MGMT protein is degraded after each reaction. This stoichiometric reaction mechanism effectively depletes the AGT content in tumors and the associated repair of alkylation damage. BG is currently undergoing clinical trials in various cancers to increase the efficacy of alkylating agents.

Interestingly, several observations suggest an inverse correlation between the levels of MGMT and p53 tumor suppressor proteins where wild-type p53 suppresses transcription of human MGMT expression. Unfortunately, p53 function is often inactivated or suppressed in human cancers; therefore, restoration of wt-p53 activity is essential for the success of some treatments. However, whether or not this is mediated by suppression of MGMT expression has yet to be determined. To date, the cross-talk between MGMT and ER-alpha (and the link to p53 expression) has not been explored in drug (i.e., tamoxifen) resistant breast tumors. The anti-estrogen tamoxifen is the most commonly used treatment for patients with estrogen receptor positive breast cancer. Although many patients benefit from tamoxifen in the adjuvant and metastatic settings, resistance to this endocrine therapeutic agent is an important clinical problem. The primary goal of present study was to investigate the mechanisms of anti-estrogen drug resistance and to design new therapeutic strategies for circumventing this resistance. The results show that MGMT expression is increased in TAM-resistant breast cancers and inhibition of MGMT by BG significantly improves TAM-sensitivity.

Results

Prolonged Treatment of Tamoxifen Increases MGMT Expression: We developed a tamoxifen resistant MCF-7 cell line by using prolonged treatment of tamoxifen on the parental ER-positive breast cancer cell line, MCF-7. Tamoxifen-resistant MCF-7 cells proliferate at rates similar to the parental MCF-7. Prolonged treatment of tamoxifen onto MCF-7 cells increased MGMT expression compared to parental MCF-7 cells by 2 fold (Fig.1).

Knocking Down ERα Enhances MGMT Expression in Tamoxifen Resistant Breast Cancer Cells: It is not known whether ERα and MGMT transcriptionally regulate each other in tamoxifen resistant breast cancer cells. We therefore investigated whether down regulation of ERα has any effect on endogenous MGMT expression in these cells. As expected, downregulation of ERα using specific siRNA significantly reduced ERα protein levels in these cells. Western blot analysis was performed and the results in the left panel (Fig. 2A) shows that silencing of ERα increases MGMT expression in these cells, and interestingly, the results in the right panel (Fig.2B) show increased MGMT mRNA levels were increased as assessed by qRT-PCR. These data suggest that ERα–mediated signaling functions to repress MGMT gene expression in breast cancer cells.

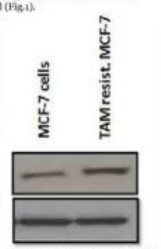


Figure 1. MCF-7 parental and tamoxifen resistant MCF-7 cell pellets were prepared, proteins were isolated and MGMT expression was detected by western blot analysis. Tamoxifen resistant MCF-7 breast cancer cells significantly increased MGMT expression compared to MCF-7 parental cells.

Transcriptional Regulation Between MGMT and p53: Previously, it was reported that p53 negatively regulates MGMT in breast cancer cells. Therefore, we addressed whether or not silencing the p53 enhances endogenous MGMT transcription. Tamoxifen resistant MCF-7 cells were transfected with either p53 siRNA (p53-KD) (Fig.2C) or MGMT siRNA (MGMT-KD) (Fig.2D) along with Non-specific siRNA (NS). MGMT expression was consistently increased in p53 knock down cells, with different experiments showing a ~ fold augmentation (Fig. 2A) and as expected, knocking down MGMT decreased MGMT transcription where as p53 mRNA levels were unaffected in MGMT knockdown cells (Fig.2D). These results confirm that p53 can regulate MGMT at the transcriptional level.

O⁶-Benzylguanine Plays a Dual Role in Tamoxifen Resistant MCF-7 Cells: Contrasting with the experiments above, next, we studied whether or not knocking down MGMT has any effect on ERα transcription. As expected, knocking down MGMT decreased MGMT gene transcripts. However, it was interesting to find that ERα gene transcription was also reduced after MGMT silencing. (Fig.2E). These data demonstrate that BG has the ability to attenuate the not only the MGMT, but also the ERα transcription, indicating a possible dual role for MGMT blockers in these breast cancer cells.

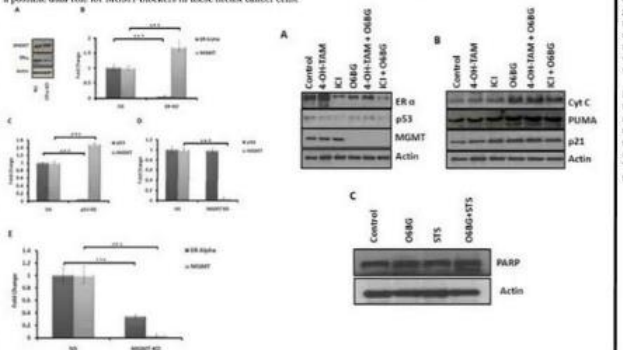


Figure 2. (A) Tamoxifen resistant MCF-7 cells were transfected with ERα siRNA (100nM) (ERα-KD) and NS siRNA (100nM) (NS), and cells were harvested 72h post transfection. Total proteins were isolated and ERα and MGMT expression was determined by western blot analysis. MGMT protein was significantly increased in ERα knock down cells (B) Tamoxifen resistant MCF-7 cells were transfected with ERα siRNA (100nM) (ERα-KD) and NS siRNA (100nM) (NS), and cells were harvested 72h post transfection. Total RNA was isolated and MGMT and ERα transcription was determined by qRT-PCR. MGMT transcription was significantly increased in ERα knock down cells. (C) Total RNA was isolated from non-specific siRNA (NS) (100nM) and p53 siRNA (50 nM) knock down tamoxifen resistant MCF-7 breast cancer cells. MGMT and p53 transcription was determined by qRT-PCR. There is an inverse correlation between MGMT and p53 in tamoxifen resistant breast cancer cells (C & D).

Figure 3. (A) Tamoxifen resistant MCF-7 breast cancer cells were treated in presence or absence of BG (50 μg) and 48h post treatment 4-OH-TAM (1μM), ICI (1μM) either alone or in combination with BG. 24h post treatment cells were harvested and proteins were isolated and western blot analysis was performed. (A) ERα, p53 and MGMT expressions (B) Cytochrome C, PUMA and p21 was determined by western blot analysis (C) tamoxifen resistant MCF-7 cells were treated with or without BG for 48h and later treated with staurosporin (1 μM/L) for 6 hrs PARP cleavage was determined by western blot analysis.

O6-Benzylguanine Modulates p53 Down-Stream Targeted Protein Expressions: Encouraged by the results reported, we investigated the effect of combination therapy on endogenous MGMT, p53, and ERα protein expressions. As expected, BG decreased MGMT expression, while combination therapy (4-OH-TAM or ICI combined with BG) significantly decreased both MGMT and ERα expressions. BG alone or in combination with tamoxifen or ICI decreased ER-α expression, whereas tamoxifen alone and ICI alone increased and decreased the same respectively (Fig.3A). p53 expression was slightly altered after ICI treatment. The reduction in p53 expression by ICI alone was reversed when BG was combined (Fig.3A). We investigated the effect of BG on proteins which are involved in cell cycle regulation, apoptosis in tamoxifen resistant breast cancer cells. All these treatments significantly increased the $p21^{Waf}$ protein expression (Fig.3B). PUMA expression was also increased with these treatments. Hence, PUMA may have translocated to the mitochondria, cytochrome C is released (Fig.3B), and apoptosis was triggered in these cells in presence of combination therapy. PARP cleavage is seen in BG treated cells in presence of staurosporin as an indicative of apoptosis (Fig.3C). Therefore, this data suggest that BG promotes cell cycle arrest and can induce apoptosis by modulating p53 function.

O6-Benzylguanine Modulated Transcriptional Targets in Tamoxifen Resistant Breast Cancer Cells: The effect of combination therapy on endogenous MGMT mRNA levels we also studied. Quantitative real-time PCR (qRT-PCR) resulted that anti-estrogens (TAM/ICI) increased the MGMT expression while the combination therapy decreased it compared to control levels. ERα transcription was decreased compared to controls with all these treatments (Fig.4A). Surprisingly, p21 and PUMA mRNA was significantly increased in the presence of combination treatments (Fig.4B &C). These results suggests that p53 mediated target gene transcription was affected by the drug combinations in breast cancer cells (Fig. 3 & 4).

O6-Benzylguanine Enhances p21 Transcriptional Activity in Tamoxifen Resistant Breast Cancer Cells: In order to investigate the effect of BG on p53 function, we performed luciferase reporter assays. Tamoxifen resistant MCF-7 breast cancer cells were transfected with p21 luc promoter construct in presence or absence of BG (target gene of p53). These results clearly demonstrate that BG significantly enhanced p21 transcriptional activity by 4-5 fold in these cells (Fig.4D).

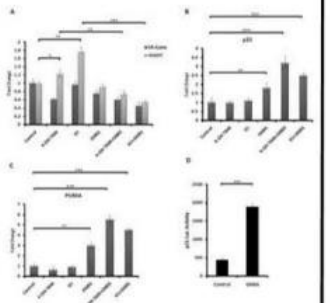


Figure 4. Tamoxifen resistant MCF-7 breast cancer cells were treated in presence or absence of BG (50 μg) for 48h and later 4-OH tamoxifen and ICI (1μM) was either alone or in combination with BG and 24h later cells were harvested and total RNA was isolated. (A) MGMT and ERα (B) p21 transcription (C) PUMA transcription was determined by qRT-PCR. 4-OH tamoxifen and ICI induces MGMT transcription. BG induced PUMA and p21 transcription. (D) Tamoxifen resistant MCF-7 breast cancer cells were transfected with p21-luc construct and 6h later treated with BG and 24h later cells were harvested. p21 transcriptional activity was significantly increased by BG in these cells.

O6-Benzylguanine Inhibits Tamoxifen Resistant Breast Cancer Cell Growth and Increase Resistant Breast Cancer Cell Sensitivity to Anti-Estrogen Therapy (TAM/ICI): Detailed necropsy revealed that all the mice had tumors in the breast. The data summarized in Table 1 show the daily BG alone or in combination with twice weekly tamoxifen/ICI significantly decreased median tumor volume and weight as compared with that seen in tamoxifen/ICI treated and control mice. The combination of BG with tamoxifen or ICI produced the greatest decrease in median tumor volume as compared with control mice (83.99 mm^3, 9.33 mmg (TAM+BG), respectively; p< 0.0001; (83.99 mm^3, 31.60 mm^3 (ICI+BG), respectively; p<0.0001). Tumor weight was also significantly reduced in mice treated with combination therapy as compared with control mice (81.23 mg, 22.30 mg (TAM+BG), respectively, p<0.0005); (81.23 mg, 51.57 mg (ICI+BG), respectively, p<0.0005). (Table.1). Body weight was not changed among all treatment groups as compared with control mice. No visible liver metastases were present (enumerated with the aid of a dissecting microscope) in all treatment groups.

Histology and IHC Analysis: We next determined the *in vivo* effects of BG (alone or in combination) with tamoxifen/ICI. Tumors harvested from different treatment groups were processed for routine histological and IHC analysis. Tumors from mice treated with BG alone or in combination with tamoxifen/ICI exhibited a significant decrease in MGMT, ERα, ki-67 as compared with tumors treated with tamoxifen/ICI alone or control group. p53 expression was not much altered in these treatment groups. In sharp contrast, the expression of p21 was significantly increased in tumors from mice treated with BG either alone or in combination with tamoxifen/ICI. The images were analyzed by ImageJ (NIH) and MGMT, ERα, p53, p21 and ki-67 expressions were quantified by the ImmunoRatio plugin. (Fig.5).

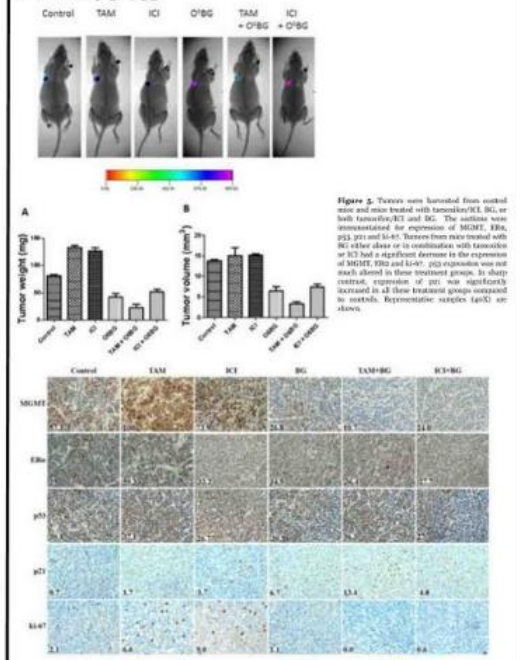


Figure 5. Tumors were harvested from control mice and mice treated with tamoxifen/ICI, BG, or both tamoxifen/ICI and BG. The sections were immunostained for expression of MGMT, ERα, p53, p21 and ki-67. Tumors from mice treated with BG either alone or in combination with tamoxifen or ICI had a significant decrease in the expression of MGMT, ERα and ki-67. p53 expression was not much altered in these treatment groups. In sharp contrast, expression of p21 was significantly increased in all these treatment groups compared to controls. Representative samples (40X) are shown.

Conclusions

1. In the present study, we observed that prolonged treatment with anti-estrogens causes drug resistance by inducing the DNA repair protein O^6-methylguanine DNA methyltransferase (MGMT).
2. Decreasing the expression of MGMT by exposing breast cancer cells to BG sensitized these cells to anti-estrogen therapy (tamoxifen and ICI 182,780).
3. We also observed that combination therapy of anti-estrogens and MGMT blockers not only overcame the MGMT derived drug (tamoxifen and ICI) resistance but also increased the efficacy of anti-estrogen therapy by decreasing estrogen receptor expression and restoration of the functional activity of p53 in tamoxifen-resistant breast cancer cells.
4. Combination therapy inhibited tamoxifen resistant breast tumor growth *in vivo*.

Acknowledgements

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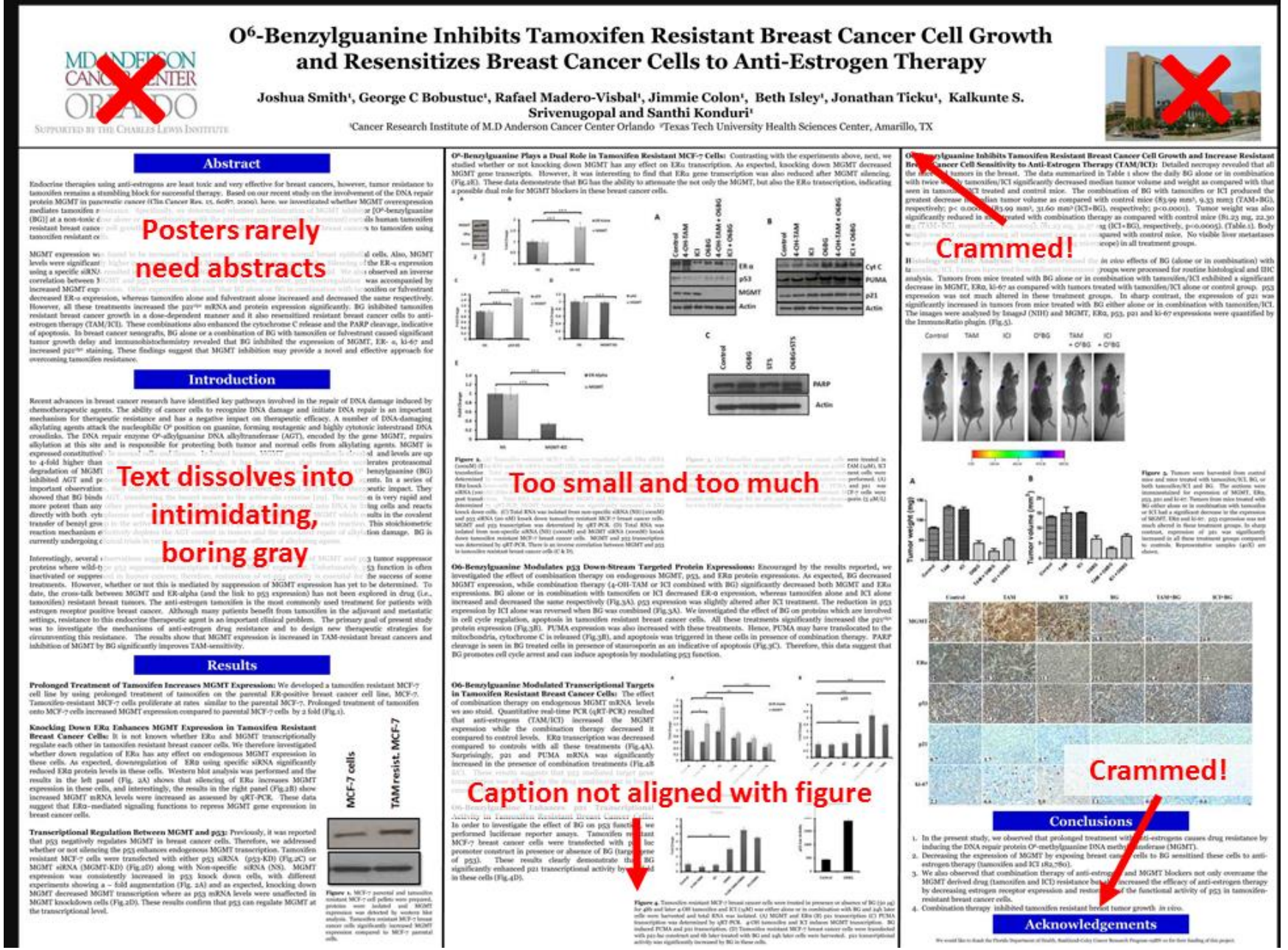
Source: https://betterposters.blogspot.com/2011/04/critique-breast-cancer-inhibition.html



Source: https://betterposters.blogspot.com/2011/04/critique-breast-cancer-inhibition.html

Presentation

Considerations

- “What’s in it for me?”

- Facial expression; eye contact; body language (keep hands open; hand gestures)
- Emphasize certain words
- Slow down and breath if you are nervous – maybe take a sip of water
- Pause to let audience think

- Engaging audience (acknowledge audience presence; ask questions)

- Do not go over the time limit.
- There are tools that can help you (Canva; Prezi, etc.)

After Presentation

- Include a final slides to encourage Q/A

- No one prevent you from preempting questions from audience

- If you don’t know the answer, be honest and follow up later


5 Minutes with Cyrill
A Good Structure
for Presentations

Practice time