normal BMI groups in different age groups. Further, we assessed 'germ line age' with a recently constructed algorithm from our laboratory used to predict an individual's age using sperm DNA methylation signatures.
Results: DNA methylation data from each sample were used to predict an individual's age/ these predictions were used to determine if age acceleration patterns exist as a result of increasing BMI. Our results showed that individuals who were classified as obese based on BMI assessment (BMI > 30) were predicted to be approximately 4% older than their actual age when compared to individuals with a normal BMI (BMI = 19-25). This increase in predicted age was true for each age category but was highest in the youngest age category (~ 5% increased in predicted age.
Conclusion: In this study, we found that patterns of DNA methylation aging were more pronounced in patients with a high BMI compared to patients with a normal BMI within the same age category. As a result, predicted age was affected and found to be overestimated in high BMI samples. Future experiments analyzing each individual's BMI history would be beneficial to further our understanding of BMI's effect on DNA methylation signals and in particular to understand the nature of epigenetic aging in the gamete.

33 (Poster)
ENVIRONMENTAL PHENOL AND PARABEN EXPOSURE IS NEAR UBIQUITOUS AND AFFECTS SERUM TESTOSTERONE LEVELS IN HEALTHY ADULT MEN
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(Presented By: Joseph Scott Gabrielsen, MD, PhD)

Introduction: Phenols and parabens are used in plastic food containers and cosmetic products, resulting in widespread exposure to the general population. Animal models and studies in pregnant women and children have found these compounds to be endocrine disruptors. Their effects on serum testosterone levels in adult men, however, are contradictory and poorly understood. We therefore sought to determine the association between serum testosterone levels and urinary levels of environmental phenols and parabens in healthy adult men.
Methods: Adult men from the 2011-2012 National Health and Nutrition Examination Survey who had serum testosterone and urinary phenols and parabens levels measured were included (n=840). Men were excluded if they had conditions/ taking medications known to affect serum testosterone levels or did not self-report good health (n=170). Two men were excluded for testosterone below 75 ng/dL. Urinary phenol/parabens levels were normalized to urinary creatinine and log transformed to approximate normality. A linear regression model was created including BMI and age, with robust variance estimation due to heteroskedasticity. The model was then rerun to include a quadratic term to determine the best fit. Results: Phenols and parabens were detected in the urine of 96% and 98% of men, respectively. Urinary benzophenone-3, triclosan, and butyl parabens were inversely associated, while bisphenol A and methyl parabens levels were positively associated with serum testosterone levels after adjusting for age and BMI (Table 1). Ethyl and propyl parabens levels were not significantly associated testosterone levels in any of the models.
Conclusion: Almost all men had detectable levels of urinary environmental phenols and parabens. The effects of these chemicals on testosterone were varied within each class; however, given near ubiquitous exposure to these chemicals, further research into their effects on the endocrine axis of adult men is critically needed.
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Class	Chemical	% samples positive	β linear (95% CI)	β quadratic (95% CI)
Phenols	Benzophenone-3	96%	-7.16 (-14.3, -0.068)	---
	Bisphenol A	89%	172 (37.5, 306)	21.4 (4.52, 38.3)
	Triclosan	72%	-9.60 (-17.3, -1.95)	---
Parabens	Butyl parabens	13%	-66.8 (-121, -12.9)	-6.54 (-13.3, 0.25)
	Ethyl parabens	37%	NS	---
	Methyl parabens	98%	13.8 (0.94-26.6)	6.10 (1.29-10.9)
	Propyl parabens	90%	NS	---

34 (Poster)
TIMING OF SPERM CAPACITATION VARIES AMONG MEN AND IS CONSISTENT WITHIN MEN
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Introduction: If inseminated too late, sperm may not complete capacitation before egg quality declines, preventing fertilization. Cap-Score™ reflects the percent of sperm that can capacitate, as determined by GM1 distribution patterns. Here we compare differences in capacitation at two time points within semen samples, within and among individuals. We used ability to undergo acrosome exocytosis (AE) to confirm capacitation.
Methods: Semen from fertile men was liquefied, washed, and incubated for 3 hrs under capacitating (Cap) conditions, then fixed and analyzed immediately (Day0); after being incubated 3 hrs under Cap conditions then maintained 22-24 hrs in fix (Day1-fix); or after 22-24 hrs incubation under Cap conditions prior to fixation (Day1). In all cases, a light fixative previously shown to allow membrane lipid movements was used. A subset of the Day1 and Day0 samples (n=10) were treated with calcium ionophore A23187 and compared to samples incubated under Cap conditions without ionophore, to confirm capacitation status. We did not assess AE in Day1-fix cells because of the presence of the fixative and its potential effect on proteins involved in membrane fusion.
Results: Day1-fix and Day1 Cap-Scores were greater than Day0 ($p<0.001$; n=25), whereas Day1-fix and Day1 Cap-Scores were equivalent ($p=0.43$; n=25). When 123 samples from 52 men were analyzed, 94% (49/52) of the individuals showed an increase from Day0 to Day1-fix. An increase of more than 1SD (7.7; calculated previously from a fertile cohort) was observed in 42% (22/52) of the men. To test whether the difference from Day0 to Day1-fix was consistent within an individual, 52 samples from 11 fertile men (≥4 samples per donor) were classified into either "early" (difference < 1SD) or "late" (difference ≥ 1 SD) groups. The average capacitation group concordance within a donor was 81%. Median absolute deviation (MAD) was used to assess the tightness of clustering within individuals. The average (2.21) and median (1.98) MAD confirmed consistency within individuals. As expected, significant decreases in Cap-Score were observed following treatment with ionophore in both Day0 ($p=0.02$) and Day1 ($p=0.01$) samples.
Conclusion: These data show that the timing of capacitation differed among men and was consistent within them. Knowing the response time of an individual's sperm to capacitation stimuli could personalize and optimize insemination time in different ART procedures.
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