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Message from the Chair

Happy New Year to you and yours! Our Christmas Social December 15th at Village Kitchen at Hartness in Greenville was a success. We had 20 in attendance which is quite good with all that's going on during the Christmas season. The Village Kitchen did a great job, and we enjoyed the food and fellowship very much. VK was a good suggestion, Conny. To those who could come, thank you very much. I know we had several people who wanted to be there, but couldn't, and you were missed. I tried to talk to everyone, if I missed anyone, my apologies.

While 2022 wasn't all we had hoped for, it was an improvement over 2019 and 2020. Let's hope that 2023 continues the upward trend. Our January 10th meeting topic is "Cell and Gene Therapy: Technologies, Manufacturing Equipment, And Design Considerations." When I came through Clemson's chemical engineering program, cell and gene therapy was more science fiction than science. Yet the chemical engineering discipline has had and will continue to have a role in bringing such futuristic technologies into commercial reality. I entered the profession because it was challenging and paid well, but I never dreamed this profession would allow me to participate in things I have over these 43 years. Even though I've reached retirement age, I don't want to. I want to keep going and see what's around the next corner. Somehow, some way, we need to get this idea out to the bright young people coming through high school and college. Show them that they can be part of something greater than themselves and make the world a better place.

Our February 21st meeting will be at Clemson with the ChE students. I know that's out of the way for some of our members,

but it's important to show the next generation of our colleagues that they are important to us. We can arrange for car pools for those who aren't that keen on driving over there alone. (I always prefer to travel the Upstate at night in the company of a "deer spotter.") We are still looking for a site visit and plant tour for April. If anyone reading this newsletter has any suggestions, we'd like to hear it.

Best Regards,

Bill Thompson, Chair, WSC AIChE

NEXT MEETING - January 10, 2023

Cell And Gene Therapy: Technologies, Manufacturing Equipment, and Design Considerations

Over the past decade, cell and gene therapies (CGTs) have gained traction in manifesting their promise to offer therapies for diseases previously untreatable by traditional means. The promise of cell and gene therapies was not only to address unmet clinical needs but to tackle the entire gamut of debilitating diseases, ageing-related disorders, degeneration and permanent damage to organ systems by enabling a regenerative approach and correcting deficiencies at the molecular and genetic level. Widespread efforts in research and development of CGTs over the past few decades have paved the way to overcome the technical challenges and develop methods and tools required for clinical and commercial implementation of these therapies. CGTs have started to emerge in the commercial space and will gain momentum over the next 1-2 decades with surges in a large number of new therapies requiring clinical and commercial manufacturing.

In this presentation, we will broadly categorize the different types of CGTs, define the typical manufacturing process and how that affects equipment selection. Deriving from current commercial manufacturing plants, we will then take a closer look at the major pieces of equipment, instruments, and their role in the process. To understand implications for site design, we will next explore how the CGT equipment connect to each other, product flows, any operation considerations and special utility requirements. We will conclude by dabbing our feet into the evolution and transition of technologies, equipment and sites that are taking place, and the outlook on what the next generation facility should look like that pharmaceutical companies and CMOs may anticipate as they evaluate their construction plans for clinical and commercial manufacturing.

Abhirath (Abhi) is a Chemical Engineer from State University of New York At Buffalo with B.S., M.S. and Ph.D. degrees from their department of Chemical and Biological Engineering. Abhi is the Cell and Gene SME at Fluor guiding facility design of this biopharma sector by bringing 16 years prior technical experience in research, development and commercial manufacturing of cell,

gene and regenerative therapies. Abhi's prior experience starts with prolific research during graduate studies resulting in numerous publications and a book chapter pertaining to bioprocess design, optimization and scale-up by employing and developing core philosophies in cellular genetic and molecular mechanisms, biomaterial and physicochemical environment engineering and biochemical process modeling. Abhi's experience continues into the biopharmaceutical industry at Lonza, Asterias and Kite, Gilead spanning the entire product development life cycle ranging from R&D, Process Development, IND & BLA filing, Process Validation, Process Characterization to Manufacturing support with root cause analyses and risk assessments (pFMEAs) and impact assessments for process monitoring and continuous process improvements. Abhi has a patent in regenerative medicine and biopharmaceuticals and continues to engage in scholastic as well as industrialization facets of the cell and gene therapy field.

January Meeting Information

TITLE:	Cell And Gene Therapy: Technologies, Manufacturing Equipment, And Design Considerations
DATE:	Tuesday, January 10, 2023
Event timing:	6:00 PM Social 6:30 PM Dinner 7:00 PM Presentation
LOCATION (in- person event):	Jacobs office 1041 E. Butler Road Greenville, SC 29607
COST	No charge
RSVP by 1/8/23	RSVP from WSC Section website if you plan to join us for dinner

Scholarship Information

The Western South Carolina Section of the American Institute of Chemical Engineers is pleased to support the Chemical Engineering program at Clemson University by offering two scholarships, one of \$1500 and one of \$1000. The scholarships will be awarded to returning Chemical Engineering students with a projected graduation date between August 2023 and May 2024.

The recipients will be announced at the joint meeting between the Clemson Student Chapter and the Western South Carolina AIChE Section on February 21, 2023.

Completed applications are due by 11:59pm, Tuesday, January 31, 2023. The scholarship application may be found on the section [website](#).

Opportunities to Assist

We welcome your participation on any level in this organization. Several committee positions are open, and this year's officers will gladly mentor members who would consider holding officer positions next year.

2022-2023 Officers and Executive Committee

POSITION	NAME	COMPANY	E-MAIL
Chair	Bill Thompson	Ortec	bthompson@ortecinc.com chair@wscaiche.org
Vice-Chair	James Young	Fluor	James.H.Young@fluor.com vchair@wscaiche.org
Secretary	Conny Walker	Independent	sec@wscaiche.org
Treasurer	Jacob Lindler	aeSolutions	jllindler@yahoo.com treasurer@wscaiche.org
Former Chair	Conny Walker	Independent	connyw@earthlink.net
Newsletter	Bonnie McCourtie	Retired	brim502@charter.net
Webmaster	(open)		
Historian	(open)		
Executive Committee	Karl McCaleb	Mitsubishi	kmccaleb2@bellsouth.net
	Anastase Ghionis	Omega Chemicals	
	Donald P Gurney, Jr., ScD, P.E.	Consultant	degurney@charter.net
	Anil Wagle	Retired	Anilwagle123@gmail.com
	Devon Clymer	Jacobs	Devon.clymer@jacobs.com
	Ann Marie Jones	Retired	anmjones@aol.com

2022-2023 Calendar of Events

DATE	LOCATION	TOPIC
January 10, 2023	Jacobs office	Site Design Considerations for Cell and Gene Therapy Commercial Facilities
February 21, 2023	Clemson	TBD Clemson professor
March 14, 2023	Jacobs office	Plant-based and Cultured Meat Products
April 2023	TBD	Plant Tour
May 2023	TBD	WSCAICHe May Social
