

WE ARE ETH – Episode 7

With Gisbert Schneider, Director, Singapore-ETH Centre (SEC) and Full Professor, Computer-Assisted Drug Design, ETH Zurich

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[00:00:00] **Gisbert Schneider:** Bringing people, students, researchers from various backgrounds together helps tremendously with problem solving in my field. And this is exactly why I was so attracted to joining the Singapore-ETH Centre, because this centre is truly unique with regard to its multicultural research approach.

[00:00:23] **Susan Kish:** In this episode, I'm talking with Gisbert Schneider, and we are recording our talk live, as we pause before our dessert this evening during the Annual Meeting of the ETH Circle here in Zurich. Our Members are our audience this evening, and they've joined us from all over the world to be here tonight. Gisbert is the head of the Singapore-ETH Centre,

[00:00:45] S E C (not the US one), S E C for short. And he's gonna talk with us tonight about how he came to take on this role, his history with the ETH and how he combines that role with being a Full Professor of Computer-Assisted Drug Design. So thank you very much for being here tonight.

[00:01:03] **Gisbert Schneider:** Thanks very much, Susan, for the kind introduction. Happy to be here.

[00:01:07] **Susan Kish:** You worked at several different places before you came to the ETH, what caused you to actually move here, join the ETH, what was the origin story?

[00:01:18] **Gisbert Schneider:** Well, the short story is I received a phone call on a Saturday afternoon from a dear colleague of ours here from et ETH. And, um, he asked me Gisbert, what's your plan for the future?

[00:01:31] I said, well, I'm a Professor at the University of Frankfurt right now. You know that.

[00:01:35] **Susan Kish:** I'm very happy in Frankfurt.

[00:01:36] **Gisbert Schneider:** Yeah. I'm happy so he said no, you move to ETH.

[00:01:41] **Susan Kish:** Well, that's definitive.

[00:01:41] **Gisbert Schneider:** And then I spoke to my wife immediately after it. Within a split second, we decided that is our future. And we are quite happy with this decision. I can tell you.

[00:01:52] **Susan Kish:** Do you make all of your decisions so quickly?

[00:01:55] **Gisbert Schneider:** Usually yes.

[00:01:56] **Susan Kish:** Oh, so what was different when you joined ETH from your position before in Frankfurt?

[00:02:03] **Gisbert Schneider:** The academic freedom I have here at ETH is tremendous. It's, it's a truly unique place. I can explore new avenues of research at the interface of various disciplines.

[00:02:18] And this is what has attracted me most.

[00:02:21] **Susan Kish:** So what were the disciplines that you pulled together? Cause I know that you do really interesting research on AI and drug design, right? What were the ones you pulled together to develop your area of research?

[00:02:33] **Gisbert Schneider:** ETH offered me the opportunity to run a chemistry lab. So a wet lab and, uh, to have a computational group at the same time. So we are combining the fields of informatics, computational sciences and practical chemistry within one group. And the tremendous challenge, which I wanted to solve were to bring these two fields together. And communicate in, in both languages, the language of computer science and math and the language of chemistry.

[00:03:05] **Susan Kish:** Now, did you yourself have background in both of those disciplines?

[00:03:10] **Gisbert Schneider:** Yes. I mean, I studied a few things, uh, not really knowing what I wanted at the time.

[00:03:15] **Susan Kish:** I can't imagine you being indecisive. Come on Gisbert!

[00:03:19] **Gisbert Schneider:** Well, well, in the beginning, I wanted to, to become a medical doctor and I studied medicine for three years. And, um, this wasn't enough because I crave for some deeper scientific knowledge. And I mean, luckily for the world, I didn't become a physician. I can tell you that my patients would have suffered. So, I decided to pursue the scientific track, focus on research. So I started biochemistry to have, have a diploma after all and often...

[00:03:49] **Susan Kish:** When you say a diploma, that's an undergraduate?

[00:03:51] **Gisbert Schneider:** No, no, no. That's the, the master's degree equivalent. At the time I studied in Berlin, in Germany at the time, uh, I had the first contact with computational modeling. So I saw these fancy images, these graphics of protein structures and...

[00:04:08] **Susan Kish:** Sort of 3D things.

[00:04:09] **Gisbert Schneider:** Right, right, right. These 3D thingies.

[00:04:12] **Susan Kish:** Right. Sorry. Okay.

[00:04:13] **Gisbert Schneider:** And I thought this is it. And I was hooked and I've been hooked ever since.

[00:04:18] **Susan Kish:** What languages did you learn in terms of computer languages?

[00:04:21] **Gisbert Schneider:** Well, um, I actually started learning Pascal with punch cards.

[00:04:26] **Susan Kish:** Good. And then after that?

[00:04:27] **Gisbert Schneider:** And after that, uh, we went over to Modula-2 and then Lisp and then Prolog and then C and then Java and name them.

[00:04:37] So, um, these languages of computer sciences helped me and help my students. I think, I think everyone should, should have at least to some degree, uh, programmed at, at some point in time, helps us to structure a line of thought how to solve a problem and to formulate that in terms of, uh, program code. That can be extremely helpful to structure a research program or a research project.

[00:05:06] And I also teach, um, programming and computational design, which is the, the main subject of my research to chemistry students and to, to biology students. And this is extremely well received. I can tell you that. And, uh, so my group consists of, I would say one third hardcore coders programmers, one third chemists and one third is a very diverse bunch.

[00:05:35] **Susan Kish:** I'm sorry. What's the last third.

[00:05:37] **Gisbert Schneider:** The last third is, um, a group of students and, and, and senior coworkers from physics, from medicine, from biology, even social sciences in part.

[00:05:49] **Susan Kish:** And why do you bring them into the mix?

[00:05:52] **Gisbert Schneider:** Because design thinking is at the heart of what we're doing, designing an object in our case, new molecules by, by computational means, um, also requires, um, the ability to challenge to have someone ask the naughty questions.

[00:06:12] Right to challenge you with what you're doing. Why do you do that? Um, how do you approach it? Is there an alternative because the various say engineers may have solved problems uh, we are facing in chemistry. Or an architect's thinking the design process of architects we can borrow from that for molecular design.

[00:06:34] So bringing people, students, researchers from various backgrounds together helps tremendously, uh, with problem solving in my field. And this is exactly why I was so attracted to joining the Singapore-ETH Centre because this centre is truly unique with regard to its multicultural research approach.

[00:06:53] **Susan Kish:** So let's talk about that transition. So you were a Full Professor, you had various programs, grad students, postdocs, the whole that, and then one day you just decided that you would you'd move to Singapore.

[00:07:06] **Gisbert Schneider:** Not really.

[00:07:06] **Susan Kish:** And Petra said she come.

[00:07:09] **Gisbert Schneider:** Not really, actually it came out of the blue. I spoke, uh, in one afternoon, actually I was called into the office of the president and i, I was a little bit...

[00:07:18] **Susan Kish:** This is during COVID?

[00:07:20] **Gisbert Schneider:** During COVID, right. I was a little bit tense. Not, not really sure what to expect there because usually if you have to go to the headmaster, you know...

[00:07:28] **Susan Kish:** Never a good thing.

[00:07:29] **Gisbert Schneider:** Uh, different story. So, and, um, Joël Mesot was straightforward and asked me Gisbert would you be interested to take over the Singapore-ETH Centre as a director?

[00:07:39] And I looked at him, said what? Me? Yes, you are the one we need. I thought, well, let me think about that. And this time it took a bit longer than a few milliseconds, but of course, I went home, I talked to my dear, beloved wife, partner in science and life for many, many years now. And together we decided let's go, um, on this adventure.

[00:08:01] **Susan Kish:** Now, should I assume from that, that the program in Singapore focuses on the area that you were focusing on? It doesn't right. It looks at issues like the future of cities.

[00:08:15] **Gisbert Schneider:** Yes. So the Singapore-ETH Centre is about, um, a healthy planet, healthy cities, healthy communities, healthy systems, and healthy individuals. And our slogan is: "the future is green, clean and healthy."

[00:08:31] There is no alternative.

[00:08:33] **Susan Kish:** Okay. There's no Plan B or Planet B.

[00:08:35] **Gisbert Schneider:** There is no Plan B. Exactly. And we are developing approaches solutions, uh, with hopefully tangible outcome to address these, uh, most challenging questions of our time. So it has not much to do with computational molecular design, at least not for now.

[00:08:54] **Susan Kish:** But it does sound, it is an area that benefits from a series of diverse perspectives. That these are system issues, right? And so architects and scientists and researchers working together can work on it. What's the most exciting project you're working on?

[00:09:12] **Gisbert Schneider:** Oh, we only have exciting projects.

[00:09:14] **Susan Kish:** I know, I know. I know. I know. But of all those exciting projects, what are the two or three that, that you make it exciting to come to work?

[00:09:22] **Gisbert Schneider:** Right, um, one of our main work, uh, horses, so to say is the future cities lab global. The future cities lab is, a program that were started by my predecessor Gerhard Schmidt, uh, 12 years ago already together with partners and friends in Singapore, um, to look at future cities. How do we want to live in the future?

[00:09:45] What makes a city livable? Um, which sustainability issues do we have? I mean, given the fact that in approximately 30 years, uh, from now we expect that roughly half of the world's population will live in an urban context rather than a rural context, we see it everywhere. Also here in Switzerland, cities become denser and how do we cope with that situation?

[00:10:09] Which effects does have on the wellbeing on the individual health on, on the say resilience of communities, for example. So here in, in this context, we have very exciting, uh, studies, for example, revolving around, uh, the question what if I planted a million trees in Singapore. Where should we plant them?

[00:10:30] Which kind of trees should we plant? And all these decisions have an effect on say the climate, uh, city climate, the urban heat island that arises from, from dense, uh, cities. We have several projects around, uh, revolving around, uh, this,

this. For example, very interesting, uh, project cooling Singapore, how to mitigate the climate effect and the urban heat island effect in the city so that, uh, we can decrease or at least reduce to some degree further increase of temperature in a city.

[00:11:04] **Susan Kish:** When he started the lab and now when you're running this lab, the future cities lab, it must be fascinating to do that in Asia, especially with the rise of these mega cities.

[00:11:13] **Gisbert Schneider:** Right. I mean, Singapore is one of the cities of the future, as I'd like to, uh, refer to Singapore, we were and still are of course, warmly welcome there because this, this is a true partnership, uh, with Singapore to develop this kind of say research program. Singapore is, could be taken as an example of many of these, uh, for many of these mega cities.

[00:11:36] In particular in Asia, but it's not only about mega cities. It's also about the hinterland and the, uh, say relationship between urban densification and all the, the effects that has on the neighborhood with regard to economics, with regard to sustainable food, uh, delivery and, and things like that.

[00:11:58] So we try to approach these types of questions in a holistic manner and that's the reason why we are so diverse with regard to backgrounds, knowledge and culture.

[00:12:10] **Susan Kish:** Can you give some of the stats about, it's not like five people, right? It's a large office.

[00:12:16] **Gisbert Schneider:** 12 years ago. It started with two.

[00:12:18] **Susan Kish:** Okay.

[00:12:19] **Gisbert Schneider:** And that was a very courageous, brave, uh, step at the time. Meanwhile, we've grown to say, uh, 120 permanent, uh, researchers and staff with 150 to 180 additional, uh, PIs and experts and research colleagues worldwide. Who spent time at, at the SEC for, for certain periods of time or with whom we are very closely associated, the SEC the Singapore-ETH Centre is part of the CREATE Initiative¹...

[00:12:49] **Susan Kish:** Okay.

[00:12:49] **Gisbert Schneider:** in Singapore, which is an, an initiative by, uh, the prime minister's office, there is actually a physical tower in in Singapore and within this tower, there are 11 such entities. Like the SEC we have MIT there, we have

¹ *Campus for Research Excellence and Technological Enterprise.

Berkeley there. We have the university of Cambridge there, university of Jerusalem and so on and so on and so on.

[00:13:12] And that makes up a worldwide, I think, unique, uh, setting where we can interact with colleagues from the top universities and at the same time, perform cutting edge research and learn from each other.

[00:13:26] **Susan Kish:** How do you manage both, you know, 300 person research office, which sounds like a lot of areas, research plus continue to run your lab in Zurich. I mean, do you ever sleep or how does that work?

[00:13:40] **Gisbert Schneider:** I rest, well, trust me, otherwise it, it wouldn't work. I mean, personally I exercise every day I go for a swim just to clear my mind and otherwise it's about, um, community building and trusting coworkers. And I have a tremendously willing and, and positively thinking staff.

[00:14:01] And I have a wonderful, uh, managing director who has joined only recently to handle most of the administrative work so that I have some time at least to take care about strategic thinking and community building.

[00:14:14] **Susan Kish:** That sounds all perfect, is there any downside to this that we're not talking about?

[00:14:20] **Gisbert Schneider:** We haven't talked so much so far. Of course you can address all kinds of topics here. Yes. Um, I mean, to me personally, it was quite a challenge to cope with the very end point focused, very structured approach, uh, of the say Singapore funding scheme and, and approach to research. So it was an eyeopener to me coming from university of Frankfurt, university of Berlin university here at the ETH to Asia.

[00:14:47] And I wanted to make that experience actually, because we are more, more or less here in Zurich at ETH bottom up driven. We have 600 professorships approximately, which are individual entrepreneurs and perform research to their liking more.

[00:15:02] So they get to set their own agenda. Right? Say I'm curious in this, or I wanna work with that professor in that.

[00:15:08] Right? So, and in Singapore, most of the research programs and directions are quite structured. So we have national goals, uh, for, for research, certain topics, for example, sustainability as, as one of the major themes. And there is quite some money research funding to attract and, and, uh, obtain. We are within this, um, strategic setting provided by Singapore.

[00:15:35] The ETH Centre in Singapore is not a truly academic institution. It's not a real company, although we are legal, separate legal entity we're in between. So it's an amazing spot to discover the benefits of a clear goal, focused endpoint focused

research approach, and mix that with a creativity that is born from bottom up approach that to me is, is the challenge personally, but also, um, when bringing together colleagues, uh, from different backgrounds.

[00:16:10] **Susan Kish:** So in other words when you went to the, the SEC, it sounds like they're very results driven.

[00:16:16] **Gisbert Schneider:** Yes.

[00:16:17] **Susan Kish:** And that was a pretty jarring change from, gosh, what do you wanna study now?

[00:16:22] **Gisbert Schneider:** Right.

[00:16:23] **Susan Kish:** Got it. So squaring that circle reconciling those two, right? How do you explain that to ETH students who come and visit or professors who come over to, to work there?

[00:16:33] **Gisbert Schneider:** Well, they make this experience, I would say on day one already when we have team meetings and clearly discuss where we, where do we stand with our key performance indicators, which we have to fulfill.

[00:16:44] And that is new to most of the students from, from ETH what's a KPI. So we have a bar telling us, uh, the percentage of success, where do we stand? Uh, where are we lagging behind for each of these projects?

[00:16:58] **Susan Kish:** It's probably a good thing you worked in the private sector before you went to academia.

[00:17:02] **Gisbert Schneider:** Yes, you're right. I started my career actually at Roche pharma in Basel Switzerland. That was at the time a decision, which was not lightly taken, uh, simply because, uh, we ran out of money as post-doctoral students, uh, no funding anymore. So my wife and I said, we have to do something. So, and at the time an academic career was, uh, not really feasible for me or for, for my wife. So we decided let's, let's try industry. And that was the best thing education wise that ever happened to me. And I can only recommend that any researcher, any professor at, at some point spend some time in industry and makes that experience.

[00:17:46] **Susan Kish:** And did you swim in the Rhine?

[00:17:47] **Gisbert Schneider:** Yes, I did.

[00:17:50] **Susan Kish:** I can imagine. Now I have a note here to ask you about your music.

[00:17:55] **Gisbert Schneider:** My music. Yeah. uh, what do you wanna know? So no talking, talking career, talking career development, there was a very brief period in my life when I had the well abstruse, um, idea of actually becoming a rock star and

[00:18:13] **Susan Kish:** Really!

[00:18:14] **Gisbert Schneider:** Yes.

[00:18:14] **Susan Kish:** I mean, he's got the hair.

[00:18:16] **Gisbert Schneider:** Yeah. Yeah. Come on. Um, no, at a teenager, um, I learned to play the trumpet and I mean, that wasn't really sexy at the time.

[00:18:25] **Susan Kish:** I was about to say, I don't recall rock stars who played the trumpet.

[00:18:28] **Gisbert Schneider:** Yeah. So, and my motivation to the guitar was actually, I wanted to play in a band and, and meet girls. And in fact it worked out.

[00:18:37] **Susan Kish:** Where did you grow up again?

[00:18:39] **Gisbert Schneider:** Uh, in the middle of nowhere. Well, actually in a tiny little town called Schlitz is some, uh, Americans will know Schlitz beer.

[00:18:47] Yeah. Humphrey Bogart's famous... the beer that made Milwaukee famous. Right?

[00:18:50] **Susan Kish:** Exactly. Right. Where is Schlitz?

[00:18:52] **Gisbert Schneider:** Where is Schlitz in the north of Frankfurt in the middle of surrounded by forests. And I mean, as a teenager, once you hit puberty, uh, you have to get away.

[00:19:02] **Susan Kish:** How big was this village?

[00:19:03] **Gisbert Schneider:** Um, this village it's, it's a small city actually has city rights oh, roughly 4,000 inhabitants.

[00:19:09] **Susan Kish:** Wow. Okay. Alright. So you were the local rock star?

[00:19:13] **Gisbert Schneider:** No, not at that time. I, I started my rockstar career in Berlin and it paid off. I met my wife at one of the concerts.

[00:19:23] **Susan Kish:** Congratulations, and you played bass guitars?

[00:19:26] **Gisbert Schneider:** No, I played, uh, lead guitar actually.

[00:19:28] **Susan Kish:** You played lead guitar. Did you sing?

[00:19:30] **Gisbert Schneider:** Yes.

[00:19:31] **Susan Kish:** Whoa.

[00:19:32] **Gisbert Schneider:** Long time ago, but I've gotten wiser and I dropped that that ambition. Yeah. Yes. I still play the guitar uh, whenever ever I find time. We once had a, had an ETH band playing well at parties from time to time, but I'm still looking for a bass player and a drummer at the SEC to, to restart that.

[00:19:51] **Susan Kish:** Uh, that sounds brilliant. And did you write music as well?

[00:19:55] **Gisbert Schneider:** I wish I could. No. Um, there is no real talent. Well, I, I think future audiences are better off with me not doing that.

[00:20:02] **Susan Kish:** I understand. Well, it sounds like you found your groove regardless.

[00:20:05] **Gisbert Schneider:** There you go.

[00:20:06] **Susan Kish:** Okay. So there are some questions that we'd love to ask during these podcast, just so to bring up some things, what is your favorite place to go in Zurich?

[00:20:17] **Gisbert Schneider:** Lakeside, and just look across the lake and see the Alps and take a deep breath, relax and say, uh, think to myself what a privilege it is to live in Zurich.

[00:20:31] **Susan Kish:** And where is your favorite place to have coffee?

[00:20:34] **Gisbert Schneider:** I don't drink coffee, but I drink tea so, um, possibly, possibly on my terrace at home.

[00:20:43] **Susan Kish:** And when you were growing up, I think you've answered this question, but what did you want to be when you grew up?

[00:20:48] **Gisbert Schneider:** Actually I wanted to become an engineer, travel the world, to support countries with droughts, to find new resources for drinking water.

[00:21:00] **Susan Kish:** That's well, it sounds like you're actually doing part of your dream now then.

[00:21:03] **Gisbert Schneider:** Yes. Yes.

[00:21:04] **Susan Kish:** Because water's a big deal in Singapore. Isn't it? Listen. Thank you so much Gisbert.

[00:21:08] **Gisbert Schneider:** Thank you, Susan. It's been a true pleasure.

[00:21:11] **Susan Kish:** Appreciate it. I'm Susan Kish, host of the We Are ETH series. Please subscribe to this podcast and join us wherever you listen, and give us a good rating on Spotify or Apple Podcasts if you enjoyed today's conversation. I'd like to thank our producers at ETH Circle and Ellie Media. And thank you, our listeners, for joining us.